Astounding SCIENCE FICTION

SEPTEMBER 1947

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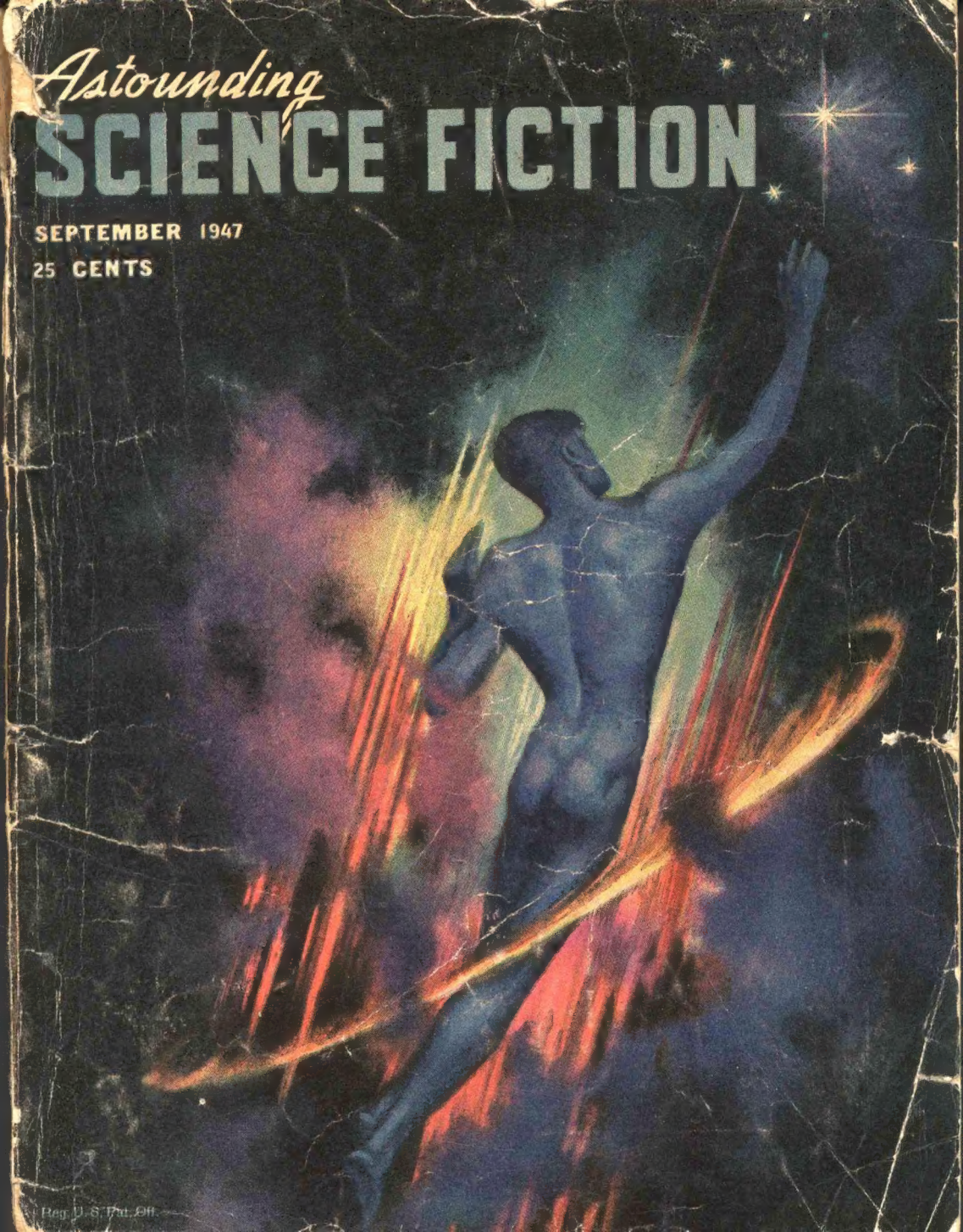

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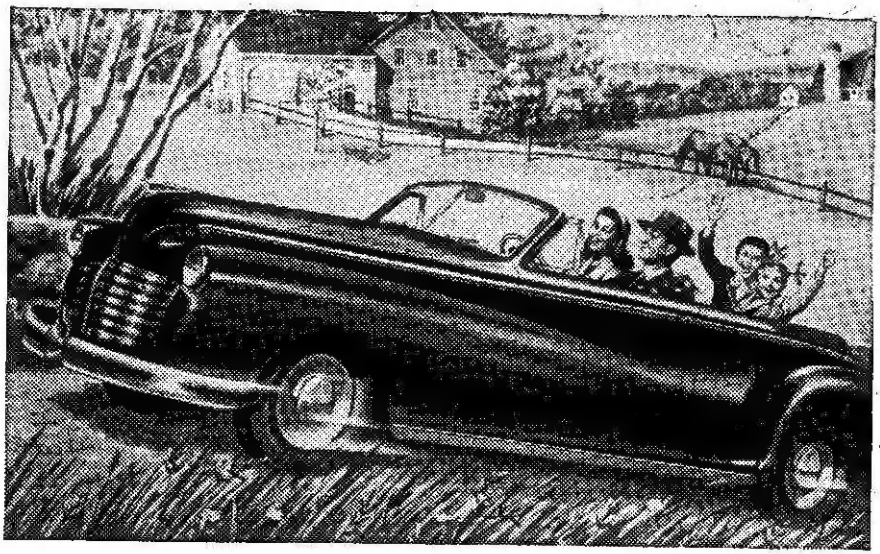

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Astounding SCIENCE FICTION

Reg. U. S. Pat. Off.

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AST—1M

ELEMENTARY APPLICATIONS

That gold, platinum, iridium, and the like noble metals occur free in nature is well known; less commonly some of the other elements occur free—silver and copper fairly frequently, iron in the form of meteoric material, and bismuth appears in metallic form in some volcanic materials. But earliest human history was founded only on gold, silver and copper metals. The Middle Ages had added mercury, lead, tin, zinc and antimony—though, because the platinum metals didn't occur in Europe, these naturally occurring metals were missing.

By the time the Twentieth Century opened, the periodic table of the elements was complete, in so far as knowing the practicably available elements went. But a lot of them were simply chemical curiosa—metallic elements like titanium, magnesium, zirconium, tantalum, tungsten, and cadmium.

The real use of the periodic table is just beginning, apparently. We're finding out "what the elements are for," so to speak. There's a radio transmitter tube, for instance, that has a thorium-alloyed tungsten filament, a gold grid, carbonized screen-grid, and zirconium-plated graphite plate. Each of the curious collection of elements is there because it has, in outstanding degree, a necessary physical or chemical property.

Tungsten, of course, is needed for the filament, to stand the high temperature required. The addition of a little thorium to the tungsten has two desirable effects; it has the physical-metallurgical effect of preventing crystallization and brittleness of the filament. And it has the electronically necessary effect of greatly increasing the emission of electrons at the operating temperature of the filament.

The gold grid isn't intended to improve the lush appearance of the tube; gold, platinum, and the other noble metals have exactly the opposite characteristic of tungsten and thorium; they are exceedingly poor electron-emitters—among the worst known. In a radio tube, the idea is that the cathode or filament emits electrons, and the control grid controls the flow; the grid is *not* supposed to emit electrons itself. But in a transmitter tube running at maximum ratings, there is a yellow- or white-hot filament inside the grid, and a red-hot plate outside the grid—and the grid is absorbing considerable power itself. Naturally, that grid gets more than a little warm—and has plenty of opportunity to emit electrons on its own account,

if it is made of an emissive material.

The carbonized screen grid has carbon for a somewhat similar reason; in this case, not only does it tend to get hot and emit, but also, when it is operating with several hundred—or thousand—volts on it, electrons strike it violently, and tend to knock out secondary electrons—as when a shell plows into a rock, it may throw out rock-chips. Carbon has a minimum tendency toward this secondary emission.

The graphite plate is used because graphite won't melt, soften or weaken, even when running rather violently red hot. (And they do in high-power, maximum-rating operation!) But graphite has a distinct defect: the stuff acts like a regular gas-sponge. It adsorbs volumes of gases, when exposed to air, and it's as hard to get the last of it out, after the structure is mounted in the tube, as it is to squeeze the last molecules of water out of a sponge.

So the zirconium is added—it has a terrific tendency to adsorb gases too. But whereas graphite tends to release adsorbed gases as it gets hotter, zirconium soaks up more as it gets hotter. Loose gas is bad in a vacuum tube—it makes it stop being a vacuum tube, a result indicated by a series of flash-overs, and the failure of the transmitter to transmit anything but a Bronx Cheer at radio frequencies.

Tantalum has a characteristic much like that of zirconium; in some tubes, a tantalum plate is used, since tantalum has so high a melting point it doesn't lose strength appreciably at bright red heat. Then the graphite can be omitted. One of the war-born radar tubes—the 15E—is about the size of a tangerine, has a tungsten filament, a platinum grid, and a tantalum plate. The plate is a paper-thin cylinder of gravish, crystalline looking metal half an inch in diameter, and about half an inch long. Yet in radar service, the tube carried 10,000 volts and delivered a peak power of 10,000 watts!

Tantalum is also used in medicine now, of course—the body tolerates tantalum even better than it does silver. Chemical equipment made of tantalum can withstand corrosive action that will chew holes in even the tough stainless steels.

Cerium is used in cigarette lighter flints, cadmium plated tools are a common sight today. Titanium metal is only now coming under close study, but already some most remarkable things have been done with its oxide. As a dielectric material, it has slightly fantastic properties; condensers that used to be half an inch square by an eighth inch thick are now half an inch long and the thickness of a blue-pencil lead. White titanium dioxide makes wonderful house paint: it stays clean and white far longer than lead paints—and, unlike lead, titanium is an extremely abundant metal, ranking close to iron in the Earth's crust.

Somewhere, there's a job for each of those unused-now elements, a job that it can do better and cheaper than any other—

THE EDITOR.

MEDDLER'S MOON

***"He was** warned agin' the woman; she was warned agin' the man. And if that don't make aweddin', there's nothin' else that can!" But how about it when the warning party is a grandson out of the future?*

Illustrated by Napoli

BY GEORGE O. SMITH

Peter Hedgerly heard the door open and close and he smiled at his reflection in the mirror. He turned partly and called out through the semi-closed bedroom door.

"Sit down, honey. I'll be right out."

Joan Willson was early, he thought, but it made no matter. It merely gave them more time togeth—

"I'll sit down," came a deep, pleasant masculine rumble, "but I'm not your honey!"

Peter hit the door and skidded into the living room, his loose shirttail flying out behind him. "Who're you?" he demanded sharply.

"Please do not be disturbed. Finish dressing," said the stranger. Peter measured him. A few pounds heavier than Peter's one hundred and sixty; an inch taller than Peter's five feet eleven. About the same sandy blond complexion. The face was wreathed in a beatific smile that in no way matched Peter's exasperation.

"I'm expecting a guest," snapped Peter. "The door was open for . . . the guest. Not for stray strangers seeking company or whatever."

"I know. My presence will make no difference."

"No difference?" exploded Peter angrily. "Look, sport, three's a crowd. Technically, you're trespassing. Shall I prove it by calling the police?"

"You may if you wish," replied the stranger. "But I happen to know for certain that you will not."

"No?" snapped Peter. He headed toward the telephone with all of the

determination in the world. The stranger watched him tolerantly. Peter reached the table beside the door and reached for the phone. As his hand touched it, the door opened and Joan Willson came in. She gulped at Peter and said: "Oh!"

Peter became aware of the fact that his nether raiment consisted of shoes, socks, paisley-print shorts and a curtailed-shirttailed WPB model shirt.

He echoed Joan's "Oh!"

His ejaculation died like the diminishing wail of a retreating fire siren. That was because the duration of the monosyllabic dipthong exceeded the time necessary for Peter to gain the security of the bedroom where he donned his trousers and wished there were something he could do to cover the blush of embarrassment on his face. His ears especially.

Through the door he heard the stranger say: "Please come in, Miss Willson. Peter's condition is but temporary."

"But why . . . what . . . and who are you?"

"That's a long story," replied the stranger. He turned and called out to Peter. "I told you you'd not call the police!"

"Police!" exclaimed Joan. "Peter, is . . . is—?"

"Not at all," said the stranger, interrupting her and intercepting the words which had been intended for Peter. "I've had too little time to make explanation. I'm Joseph Hedgerly."

"Relative of his?" asked Joan.

"Quite. And quite close."

Peter called: "Never heard of you."

"You will," replied Hedgerly. "You see, Peter, I'm here to help you."

"And if I need no help?"

"You do."

"Let me be judge, huh?" snapped Peter.

"You're in poor position to judge. That's why this help is thrust upon you, so to speak. After a bit you'll understand."

"Thanks," said Peter. Slowly he came into the living room again and faced Joan, still flushed.

"Honest, Joan," he started, but the girl shrugged. "Don't apologize for a sheer accident," she said.

"It was no accident," said Hedgerly.

Peter whirled. "Look, chaperone, who invited you in? As for any relation of mine? Are you?"

Hedgerly arose carefully. "I am Joseph Hedgerly, your grandson."

Joan looked at Peter and laughed heartily. "Peter Faust Hedgerly. Having a thirty-odd year grandson is quite a record for such as you," she told him. "You will only be thirty-two next birthday."

Peter turned to the other angrily. "Can it," he snapped. "Grandson my ankle!"

"I am your grandson."

"Yeah . . . sure. Shall I call the cops now?"

"You could, but you will not."

"Oh spinach!" Peter headed for the phone again but the stranger said, quietly, "Might listen to me, Peter."

Peter stopped, turned, and said: "Explain—and explain fast!"

"You are a physicist with the Abstract Laboratory at Chicago. You also tinker in your study here. Your son—my father—will take up home-tinkering also, and your son's son—myself—will eventually discover the secret of time travel. I've done this. I am now here to see that things evolve with a minimum of effort."

Peter shrugged. "You could have saved your time," he said. "If you'd not interfered, I'd have asked Miss Willson to marry me."

"That's the point," smiled Hedgerly. "You see, Peter, my grandmother's name was not Willson, nor Joan. Peter Hedgerly—according to the family history—married a girl by the name of Marie Baker."

"Never heard of her," grunted Peter.

"You will," smiled Hedgerly. He turned to Joan. "I'm sorry," he told her. "I have nothing against you; in fact you appear to be of the finest. You will naturally understand there is nothing personal in any of this. It is merely a matter of historic fact that Peter will marry Marie Baker."

"Mr. Hedgerly," she said, "I dislike you thoroughly. Furthermore, I'm not too certain that history is as solid as you think. Until further notice, then, I hereby accept Peter's sidelong proposal of a moment ago."

"Joan!" cried Peter running forward and folding the girl in his arms.

"Very fetching," observed Hedgerly with the air of a man observing the antics of a couple of goldfish in the proverbial bowl. "Considerable boundless and mutual enthusiasm, but both terribly and unhappily misdirected. In other words a sheer waste of time and energy."

Joan and Peter unclinched and faced Hedgerly. "We like it," they said in chorus.

Hedgerly nodded understandingly. "But Marie Baker wouldn't."

"Let's go out, Peter," pleaded the girl earnestly. "This unwelcome bird makes me feel like a female homewrecker!"

Hedgerly beamed. "Do go," he said. "And enjoy yourselves until I can locate Peter's future wife—my grandmother."

The big machine should have been quiet according to theory. It had no moving mechanical parts to hum or gears to clash nor levers to chatter. It had for its moving-member a magnetic field that varied on a pure sine wave of intensity from a terrific flux-density in one direction, through zero, and thence to an equally terrific flux-density in the opposite polarity. At one newspaper interview as the machine was being built some reporter had erroneously noted that the magnetic field strength at maximum was strong enough to affect the iron in your blood. This was intended for sheer hyperbole, but the fact remained that the magnetic field between the big pole pieces was strong enough to warp the path of light. Well, the shift *could* be measured with the most delicate of optical instruments.

Theoretically, a varying magnetic field should not make a sound.

Actually, it did. The field at maximum was strong enough to cause deep magnetostriction of the magnetic metals of the machine. They vibrated in sympathy with the varying field; their dimensions changing enough to set up sound waves in the air of the room.

So the theoretically silent machine actually made a clear humming roar that shattered the eardrums and seemed to press offensively on the skulls of those working within the chamber.

Even Peter Hedgerly found it oppressing after an hour or two, and he of all men should have been used to it.

He removed his eye from the observing telescope and blinked to relieve the strain. He looked up at Joan, nodded affably, and his right hand snapped the main switch.

The terrible humming roar died. "Hello," he said brightly. "What brings you here?"

Joan Willson laughed sourly. She handed Peter a newspaper. Peter bent his head to read:

Personal! Marie Baker, Age 27, weight 114, brunette, brown eyes, minute scar on left thigh, Social Security Number 340-01-6077 please contact—

"I don't want her!" stormed Peter.

"The advertisement says you do," cooed Joan.

"Now look, Joan—"

She laughed and laid a cool hand on his cheek affectionately. "I know you don't. But I did want to point out that your—grandson—is wasting no time."

Another voice interrupted. "Naturally not," interjected Hedgerly. "After all, I'm here to see that things do go according to history."

"History be damned," snapped Peter. "I—"

"Really have very little to say about it," smiled Hedgerly. "You'll do exactly as . . . as you did!"

"Then," blazed Peter, "why not let nature take its course? If I'm to meet and commit matrimony with this Baker dame, I'll do it!"

For the first time, Hedgerly looked less than the complete master of everything he surveyed. "It is also historic fact," he said in a sepulchral tone, "that I add my efforts to make history satisfy itself. You see," he said, brightening, "how it all comes out!" He dug into an inside pocket and came up with a wallet. From it he extracted a newspaper clipping yellow and brittle with age. "Here is the original. I just copied it for the advertisement."

Peter took the aged clipping and read it. His hands shook and the clipping fell apart.

"No matter," smiled Hedgerly. "Its job is done."

"Is done?" demanded Peter.

"Of course. Marie Baker will be at your apartment this evening."

"I'll scratch her bald-headed," threatened Joan.

Hedgerly shook his head. "No, you won't," he said positively. Then he looked down at Peter and his eyes ran over the experimental setup. "It won't work," he said to Peter.

"You're on the wrong track. It is impossible to accelerate and focus and direct the neutron. The neutron, possessing no charge, is therefore unaffected by either magnetic or electrostatic fields."

Peter looked up quietly. "I've evidence to the contrary," he said. "We believe that the neutron does possess a charge; that it is theoretically impossible for anything to exist without some charge, though the charge may be exceedingly minute. We believe the neutron to be possessed of a charge of plus or minus —depending upon the moment of intrinsic angular momentum—ten to the minus fifteenth electrostatic units less than that of the electron. Therefore—"

"You will find that the experimental evidence you get is impure," said Hedgerly. "You'll save time if you abandon this project."

"Indeed? And what should I take up?"

"You'll do history a better turn if you take to investigating the magnetic properties of mass."

"Is that a matter of history, too?"

Hedgerly shrugged. "If I told you all I know about it," he said in a superior tone that made Peter want to commit homicide, "then you'd have too much time to sit around and feel frustrated because fate is a written book."

"Spinach," snorted Peter. His hand hit the main switch again and the humming roar leaped out at them from all sides. Peter grinned as he noted the wrist watch on Hedgerly's arm. Unless the character had a one thousand per cent nonmagnetic movement, the insides by now would be keeping the Devil's Own Time.

It was nine o'clock. For the eleventh time since dinner, Peter leaned out of his study and called: "Now?"

Hedgerly shook his head. "Not yet," he said.

"Well," said Peter this time. "Come in here. I'm on the trail of something.

"I know," replied Hedgerly. "You've discovered the Hedgerly Effect."

"The what?" stumbled Peter.

"Named after its discoverer. You're quite famous in the future, you know," replied Hedgerly.

"What is this Hedgerly Effect?

"The one you've just discovered," replied Hedgerly.

Joan Willson, present because of sheer curiosity pertaining to this Marie Baker creature whom she was prepared to dislike on sight, looked up from her book and drawled: "Oh brilliant repartee. You sound like that Cyril Smith routine that goes 'Who's he? Who's who? Him, the man in the picture. What picture?' And so forth for about an hour."

Peter smiled. "I suppose," he said. "But it's his fault, not mine. This effect is a sort of artificial generation of gravitic force."

Hedgerly nodded. "The first historic discovery that proves the relationship between magnetic phenomena and gravitic force. Now we're on the right trail," he concluded. Hedgerly walked over to the small

barrette and mixed himself a drink. He lounged back against the bar and lifted his glass. "To my grandfather," he said. "The discoverer of the Hedgerly Effect!"

Peter looked at Joan weakly. "It's fratricide to kill a brother, patricide to kill a father, homicide to kill just anybody, infanticide to kill your son, but what is it to kill a grandson?"

Joan looked Hedgerly up and down and her lip curled in derision. "Insecticide," she snapped. "Ignore him. Maybe he'll go away. But Peter, what does this gravitic effect mean?"

"I'm not too certain," replied Peter wrinkling his brow. "Of course, since gravitic fields do act upon mass without charge, we can now filter out, accelerate, and focus the neutron—or we will be able to as soon as we get this effect refined. And if we can generate gravitic fields at will, we can nullify the gravitic mass or gravitic attraction of masses. That means a complete revision of all the mass-ratio tables pertaining to space rockets. In fact, it may do away with rockets entirely. And the following is conjecture but may be possible:

"The reason that the limiting velocity is the speed of light is due to the fact that the mass approaches infinity as the speed of light is reached. That means that no possible energetic principle can be used to attain the speed of light since this increase of mass is a statement of the mass-energy put into the article accelerated. In other words, Joan, to increase the velocity of anything to the speed of light requires that you pack into it the equivalent energy required to raise its mass to infinity. Meaning of course, infinite energy.

"However, if this local generation of a gravitic field can be used to nullify mass, we can make a spaceship that need not increase in mass as its velocity increases.

"Providing that my reasoning is any good. This is just conjecture and guess. I don't know yet how much this gravitic generator will cover."

"You've done a fair job so far," said Hedgerly, mixing another drink. "Of course, you'll let it drop there."

"Let it drop?" yelled Peter. "With a thing like this at my doorstep? With the twinkle of a slide rule I can become the Originator of Interstellar Travel, and you expect me to let it slip?"

Hedgerly smiled tolerantly. "The discoverer of the Hedgerly Effect does not become involved with space travel," he pointed out with a knowing air. "He does become the layer of the cornerstone for Time Travel, which we believe is as important."

Peter looked glumly at Joan. "Methinks of suicide," he groaned. "I invent Time Travel and for the next million years my invention becomes the curse of mankind. Pandora's Box never let out any trouble-scorpion as bad as people like my temporally-gadding grandson!"

"Now, grandpop, don't be bitter," laughed Hedgerly.

"Grandpop?" yelled Peter. "I'll—"

The doorbell rang, interrupting a string of threats. Hedgerly stepped springily to the door, opened it, and said: "Please come in, Miss Baker. We're expecting you."

Peter whistled.

Joan hissed.

The room became three degrees warmer.

Miss Marie Baker was curvaceous. Miss Marie Baker was dressed to prove it. Miss Marie Baker knew it. The Petty-Girl calendar on Peter's living room wall took on a drab and lumpy appearance and on the table beside the divan, a magazine cover became blank as the model headed for the powder room.

Marie Baker spoke, and Arthur Sullivan moved in his grave because the sound of her voice was that reminiscent of that great Lost Chord of music. "I'm quite mystified," she said.

Hedgerly took her slender hand. "Please come in," he said. "And we'll try to explain. You've come, Marie, to be introduced to your future husband!"

The door behind Marie filled again—and filled is the proper term. He stood six feet four, the floor creaked under his two hundred and twelve pounds of sheer muscle, and the litheness of his step carried him with pantherine grace. "May I point out," he said in a voice that reeked of Harvard, Cambridge, and a complete disregard of the letter 'R,' "that Miss Baker may be already acquainted with her future husband?"

Hedgerly faced the giant. "Please," he said in a pained voice. "I'm having enough trouble now without your unwelcome aid. Any relationship between you and Marie Baker must shortly become, at best, platonic."

A small brass figurine of Rodin's Discobolus took a sidelong look and made the brazen observation that being platonic with such as Miss Baker was an idea never suggested by his friend Plato. Plato had too much sense.

"Just how do you figure in this?" demanded the giant.

"Have we met?" asked Hedgerly.

"I'm Anthony Graydon. And my query goes still."

"Pleased to know you, Mr. Graydon. I trust your intentions toward Miss Baker are simple?"

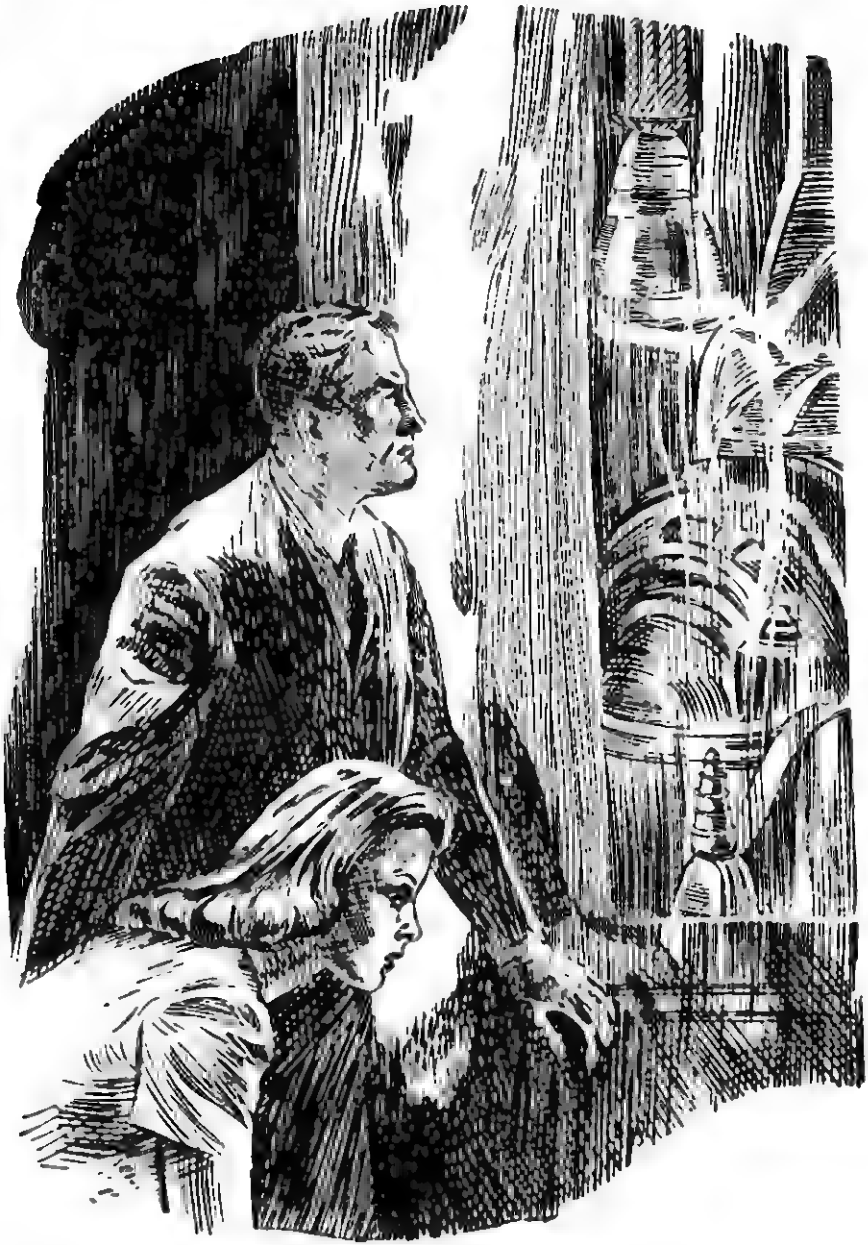
"Miss Baker happens to be wearing my engagement ring," returned Graydon. Hedgerly looked, and saw a bit of glitter about the size of a small pigeon's egg on her left hand.

Hedgerly shook his head sadly. "May I introduce Miss Willson?" he suggested. "Miss Willson, will you meet Mr. Graydon? Perhaps, Mr. Graydon, the no-longer-needed engagement ring will fit Miss Willson."

Anthony Graydon looked down on the time-traveling man with grand contempt. "You have all the sheer, cockeyed assurance of an egomaniac," he said. "Is Marie supposed to marry you?"

"Oh no," explained Hedgerly. "She'll marry him. Miss Baker, may I present Mr. Hedgerly. Marie, this is Peter."

He took Anthony by one arm and Joan Willson by the other and



steered them towards the door. "Let us leave them alone," he said. "They must become acquainted."

"Look," snapped Anthony, "this has gone far enough "

"Please," interrupted Hedgerly. "this is serious. Miss Willson will tell you that what I say is true, however unwilling she is to face the bitter truth. It is only a matter of time before Miss Baker becomes Mrs. Peter Hedgerly."

The door closed softly behind the three of them before Tony Graydon turned to Hedgerly and said: "What kind of high-octane are you using in your crystal ball these days, Swami?"

"Swami? But please, this is not the work of a charlatan. This is historic fact."

"Sure. So is my girl marrying that bird, huh?"

"They will marry," replied Hedgerly.

"Yeah? That's not very complimentary to me," snapped Graydon. "I've been number One man with Marie for quite some time now. I hardly think—"

"Give them time," replied Hedgerly succinctly. "In a short period, the propinquity in which they are thrust "

Graydon whirled Hedgerly around by grabbing both lapels of the coat in one large, well manicured hand. "Propinquity!" exploded Graydon in full volume, which was enough to cause endless echoes up and down the corridor. Then even the echoes had echoes for a full minute.

Joan Willson backed out of the way. The hand that enclosed both lapels of Hedgerly's coat looked well manicured and in excellent care, but she had a firm hunch that *well-tended* included the matter of keeping it firm, hard, and dangerous. Graydon was no cream puff, and of a size where even a cream puff is respected.

But Graydon did not dust his knuckles off against Hedgerly's nose. Breeding came to the fore, and Graydon let the other man relax. "Propinquity," he said in a level voice that sounded very firm, "presupposes that you and I and possibly Miss Willson are going to spend some time in hurling my fiancee and that character together."

"Of course we are," replied Hedgerly, with all of the assurance in the world.

"We—are—not!"

"Oh, but we are," said Hedgerly. "And I'll tell you why."

Graydon smiled bitterly. "This," he said to Joan, "is going to be good." He looked at Hedgerly. "It had better be!"

Marie Baker shrugged her shapely shoulders and looked very puzzled. "I don't understand," she said.

"Miss Baker, please let me explain," pleaded Peter. She nodded, and Peter plunged into the explanation as completely as he could. Then

"Peter," she said quietly and very sincerely, "I'd hate to hurt your feelings, but I'm afraid that . . . that—" her magnificent voice trailed off weakly as she fumbled with the

pint-sized diamond on her left hand.

Peter patted her shoulder. "I am glad you are a sensible woman," he told her. "I'm rather taken up with Joan, you know."

"Then what can we do?" cried Marie.

"I don't know," grumbled Peter. "This is the way I see it; he's . . . uh . . . our grandson, and—" he looked at her curiously. "Uh . . . what's the matter?" he asked suspiciously.

Her laughter came bubbling up from below the surface and it tinkled across the apartment like the sound and fragrance of a bubbling fountain. It was a genuine laugh deep and hearty and just long enough to be enjoyed. Then she explained: "I'm sorry –not really sorry about laughing, I mean, but look, Peter, have you ever considered that you and I have been formally introduced by our grandson?"

"It sounds slightly indecent to me," grumbled Peter.

Marie shook her head. "If anything," she said quietly and sincerely, "is *fait-accompli* it is the very definite person of—our grandson."

"I'd been psychopathically avoiding that," he said. "Trying to ignore it."

"It looks," she began in a trapped voice, "as though we're stuck. If that bird is really our grandson, we might as well give in. Come here, Peter, and hold my hand."

He took her hand gingerly.

"You may kiss me, Peter."

"Thanks," he said dryly. "I'll keep your offer open until a more propitious date. Meanwhile, Miss Baker, I'll continue to feel slightly angry at being told what to do; when to do it; and with whom. Even though the Book of Acts is complete down to the final decimal."

Marie laughed cheerfully again.

He looked at her curiously. She stopped laughing. She leaned forward gracefully and offered him her right hand again. "Shake," she said.

He shook.

"Now," she said seriously, "let's at least be friends. I'm not inclined to take to being hurled at any man's head. I might add 'either.' But if this Book of Acts is the complete thing it seems to be, we'll find it out soon enough. But," she said leaning back against the divan, "I won't marry any man I do not love. And I happen to love Tony."

Peter nodded. "I happen to love Joan Willson," he said. "Until I change, we'll let it continue that way."

"O.K.," chuckled Marie Baker. "Gin Rummy!"

"Right," said Peter reaching for a deck of cards.

Graydon looked at Hedgerly across the top of his glass. "If you're from the future," he said. "you could do some real chipper things."

Hedgerly nodded. "I know what you're thinking," he said. "You believe that I have the advance dope on the stock market and other items for speculation."

"Well?"

"I have. Of course, my time hap-

pens to be some sixty years after now, understand?"

"Perhaps, what are you driving at?"

"I'm trying to tell you," said Hedgerly, "that if I help you amass a fortune on speculation, this will be known fact by my time."

"So?"

"So," said Hedgerly, "the only thing I've done—the only thing that is historic fact—is that which I'm going to do for proof. Just one thing."

"Go on."

"I'm going to write something on this envelope. Then I'm— Wait. We'll do it. I came prepared."

He wrote a sentence on the flap of the envelope and handed it to Joan. "Keep it carefully," he told her.

"Now," he said to Graydon, "There will be a big nine-event day at Bay Meadows tomorrow. I have here a listing of nine horses. You will put a sum of money on these nags and you will become famous as the first man ever to win a complete nine-horse parlay."

"Interesting if true," said Graydon, looking over the list. "We'll know tomorrow."

"We'll go out to the track tomorrow," said Hedgerly.

"What about Marie and Peter?" asked Joan.

Hedgerly smiled. "True love," he said, "never runs smooth. Peter and Marie are busy playing Gin Rummy now, and both of them agreeing that they'll have none of this. But propinquity—"

The low growl in Graydon's throat stopped him cold. Perhaps his history told him to stop.

The roaring hum of the generator made speech difficult but not impossible. Marie, with pencil in hand, was interestedly recording the data that Peter was calling to her. His lips brushed her ear occasionally because it was necessary to get the figures across through the din. The brush of lip against ear was not unnoticed; under the circumstances it was hard to ignore anything, even the least minute of personalities. Finally he snapped the switch and the roar died.

"That's it!" he said exultantly.

"It's beyond me," said Marie, looking dazedly at the solid bank of figures she'd written down.

"That's because you've never been exposed to the stuff before. Come on—I'll show you."

He snapped the safety switch and watched the last dying flicker of the radiation counter above the control panel. Then he pressed a button and a huge door creaked open. He led Marie along a zigzag hallway, explaining, "Radiation products, like all Chinese Devils, travel only in straight lines."

Then, inside of the shielding, she saw the generator.

"This made that terrible racket?" she asked.

He nodded.

"I'd hate to be inside here when it's running," she said nervously.

"Me, too," he grinned. "But I daresay the radiation would kill you long before the noise did."

"Oh!" she gasped, getting the im-

plication of the dangers of nuclear physics in one gulp.

"This," he said, "is brand new. In the center is a small, thin-walled brass container filled with radon gas, and suspending a cloud of finely divided beryllium. This produces neutrons. Very slow neutrons not worthy of mention compared to most nuclear reactions. However this is but a source instead of a complete deal.

"The neutrons emerge from the container in all directions, but are urged into motion by a swift increasing pulse of gravitic force. It used to be magnetic, but it is now gravitic. We've changed it over according to my findings of recent work. Then with the neutrons moving in a cloud, we alternate the gravitic field, varying it from attraction to repulsion. Just like a cyclotron uses radio frequency energy in the Dee Plates, we use gravitic energy to accelerate neutrons.

"Probably doesn't mean too much to you," he said with a smile. "But for the first time in history we can hurl a beam of neutrons of any desired range of energies at a target in any desired cross-section."

"It must be important," smiled Marie. "It is so complicated."

"Sophistry," he grinned. "Remember those 'nonsense engines' that were full of spools, levers, gears and stuff; all working furiously but producing nothing?"

"'A tale told by an idiot,
Full of sound and fury,
Signifying nothing,'" quoted Marie.

"Sort of like our friend Hedgerly," grinned Peter.

"Speaking of the devil," came a voice. Hedgerly came in through the winding passageway, followed by Graydon and Joan Willson who came last. Joan passed through the group until she could take Peter's arm. "Peter," she said. "I'm wealthy."

"So?" he said.

"Hedgerly produced a nine-horse parlay at Bay Meadows. Mr. Graydon . . . Tony, that is . . . put down a ten dollar bill on it in my name. I'm now possessed of about sixty-three thousand dollars."

Ignoring the statement, Peter squinted at Joan and asked: "It's 'Tony, that is' now?"

Graydon scowled faintly. "Let's all be stuffy," he said.

"Sorry, Graydon," said Peter. Graydon nodded. He thought he understood. He tried to, anyway. As irking as the situation was to him—having this character Hedgerly blithely hurling his fiancee at Peter's head and callously telling everybody else that they might as well give up trying to change Fate—he believed that Peter and Marie both were more than irked at being hurled together. Peter was not a boor, nor even stuffy.

Joan filled the silence. "That isn't all," she said. "Last night Hedgerly wrote this in an envelope before he gave Tony the horses to pick. It says: 'Graydon will place ten dollars on the parlay in Joan Willson's name and she will win sixty-three thousand, four hundred seven dol-

lars and sixty cents.' That's what happened, Peter."

"Um," said Peter.

"Trapped," said Marie.

"Gypped," growled Graydon.

"Bought," muttered Joan.

"I've told you again and again," said Hedgerly, "that no matter what you do, you're doing just what history says—note the past tense—you did! Even to producing a means of controlling neutrons, Peter. Now, of course, you'll continue here, though this being the Theoretical Physics Laboratory, you'll let this information disperse. The other boys will pick it up and develop it while you continue to delve into the relationship between magnetism and gravitics."

"And suppose I do not?"

"Oh, but you did."

"Not," growled Peter, his voice reaching a crescendo, "if I go nuts first!"

Hedgerly spoke quietly to Marie. "You take care of him," he told her. "There's nothing like it for cementing a fond relationship."

"Must I give up my life work?" exploded Peter angrily. "I'd rather work on this gadgetry than eat! I've got me a lead that may end up by making me as famous as Faraday or Einstein and if I follow it, I'll end up so far behind the eight-ball that it'll look like a split pea."

Marie leaned back against the frame of the generator and smiled at him. "This," she said in a voice dripping with phony tones, "is a shock to me. Men usually brave fire and flood to touch the hem of my skirt." But you'd rather give up being historically famous than—"

"Shaddup," snapped Peter. "And let me think!"

"Think?" muttered the girl helplessly. "I think we're licked."

Peter nodded. "Licked, drawn, and quartered. Y'know, Marie, I've tried to resent you. I can't. Probably because I know you're in the same boat as I am."

She nodded. "Whatever he does, whatever we do, he's got the answer and he gives it one hundred per cent. No man in his right mind would ever have stood up to Tony and told him to reduce his feeling toward me to platonic friendship. Not unless he knew beforehand that Tony wouldn't half-kill him. But I am beginning to understand. Even though what he says is odious, I must admit that it does come to pass."

Peter looked unhappy. "This is a fine mess," he said. "It wouldn't be half bad if Hedgerly and his confounded history were capable of changing our feelings as well as our lives. But he blithely ignores the fact that you and I are expected to marry—with both of us feeling that we'd rather marry someone else, and know who. Then to top that, not only is it going to be emotionally difficult in the first place, but think of the emotional wrench we'll get when Tony and Joan—" Peter stopped, swallowed hard, and then added: "I'm not speaking too selfishly, Marie. I've not mentioned how they will feel. The whole thing is a trumped-up mess."

Marie put her hand on Peter's

arm. "I don't exactly love you," she said with a shy smile, "but you are a very nice guy, Peter."

"Huh?"

"You're sensitive and gentle and thoughtful of other people's feelings. I have a hunch that you could also be very hard and rough if the need arose."

Peter smiled a little crooked smile and said: "All of which gets us nowhere, does it?"

"No," admitted Marie. "But if I'm going to have myself hurled into an 'arranged' marriage, I'd rather it be with someone I respect."

Hedgerly leaned over the back of the divan in Peter's living room and looked from Joan to Tony, one on each side of him. "What's so wrong with it?" he asked. "People have been happy in prearranged marriages for centuries. Sometimes the participants never meet until they are introduced by the minister."

Tony looked up sourly. "Hedgerly," he said, "you may have traveled back into time. But mister, you didn't come THAT far back!"

Hedgerly shook his head impatiently. "I fail to see why people rant against their fate. It is written that Peter and Marie get married. It is also written that they celebrate their golden wedding anniversary—shucks, I was there as a kid and I know. They were very happy together."

"So?" demanded Joan.

"So you might as well give up," said Hedgerly. "As I told Peter when I arrived a few days ago, I've come to help him. The chances are that things would have gone off all right if I'd not come. Peter and Marie would have met, regardless. As for you and Tony, Joan, I might tell you that you were very happy together, too. So you might as well give up completely and accept the dictates of fate."

"I hate to go through the motions of a play for nothing," grunted Tony.

Hedgerly winked at Joan. "You'll find some of the motions are fun," he said.

The door opened and the other couple came in. Hedgerly looked at them and smiled genially. "Have fun?" he asked. His tone was that of an indulgent father.

Peter looked vague. "We've been sitting and talking."

"No better way of becoming acquainted," smiled Hedgerly. He leaned back over the divan. "Let's go out and leave them alone," he said in a low, quiet voice.

Tony shook his head. "I live in strict bachelor quarters," he said. "And Joan couldn't have a visitor at this time of night. And I'll not go out and sit on a park bench so that some bird can make time in a comfortable living room with my fiancee."

Hedgerly shrugged. "This, then, is one time when four's company but five's a crowd." He said goodnight all around and then left, knowing that the two couples would talk for hours, and each word would bring better understanding.

For this was it.

Hedgerly went to his hotel and called a private airport. "I want

two planes ready to be hired for a quick trip to Yuma," he said. There was answer. "No, I'm not hiring both. I'm just telling you that there will be another party inquiring. You'll see that they're satisfied. Let me know when they do. I'm going in the second plane."

Then, because he knew he'd be up most of the night and early morning, Hedgerly went to bed.

Back in Peter's living room, there was not a quiet discussion. It was an armed rally.

"I'll speak plainly if I can," said Peter, striding up and down. "And when I miss a point, someone can call me on it."

"I don't know what you're after," said Tony, who was holding Marie's hand in a manner that should have disturbed Hedgerly's sleep. "But I'm for it."

Peter smiled. "Hedgerly is supposed to be my grandson," he said.

"I'm to marry Marie. We are to celebrate a golden wedding. Fine and dandy. Now look: The one weak point in Hedgerly's wild story is the question of why he came back?"

"Because it is so written," suggested Joan.

"Fine," grinned Peter. "Now leaving all personalities out of this for the moment, Marie, if you were introduced to me at a party, would you be interested in me?"

"Perhaps," she said. "On the other hand, Peter, you're not a spectacular chap. One must really know you before one can see what makes you tick. Then they're not certain. I wouldn't know, really."

"But how do you feel now?"

"Resentful! As much as I know and admit that you are a fine man, Peter, I feel as though I were being forced into a duty that offered little compensation."

Tony nodded and then said: "Look. I can sum this all up, I think. Peter, you are welcome to enter my home at any time. You can even be known and recognized as my wife's best friend."

"Just so," interjected Joan, "he doesn't get too friendly."

Peter grinned. "We're a long way off of the track," he said. "This is as much a time cliché as the fiction about the man who stabbed his father. The joker is, what do we do about it?"

"What can we do?" asked Joan helplessly.

"All we have to do is to foul him up just once," said Peter. "If he doesn't come back to annoy us, then Marie and I may never meet."

"In other words," said Tony, "the pattern is complete only when Hedgerly comes back and interferes."

Peter nodded. "Either we live by accident and die by accident or we live by plan and die by plan. If our lives are written in the Book of Acts, then no effort is worth the candle. For there will be those who will eternally strive to be good and yet shall fail. There will be others who care not nor strive not and yet will thrive. Why? Only because it is so written. And by whom? By the omnipotent God. Who, my friends, has then written into our lives both the good and the evil that we do ourselves! He moves us as pawns, directs us to strive against odds yet knows that we must fail because he planned it that way. For those, then, that fail there is everlasting hell.

"So," said Peter harshly, "I plan that this goldfish shall try to live in air." He plunged his hand into the aquarium and dropped a flipping fish onto the table. "I direct that this goldfish shall try to live. See, it strives hard to live in an unfriendly medium. It fails—of course, because the goldfish is incapable of following my dictate."

Peter's face took on an angry expression. "It has failed to obey me," he thundered. "Ergo it must be punished!"

He lifted a heavy letter opener and chopped down, cutting off the head of the still-gasping fish.

"And that," he said bitterly, "is predestiny!"

"All of which proves—?" asked Marie.

"Hedgerly exists," said Peter. "But suppose Hedgerly exists only as a probability. A probability that he himself has made high. You see, there is always the probability that any man will meet any woman. Suppose the outcome of this probability was strong enough for the outcome—Hedgerly to invent time travel, and then come back here to insure the probability?"

"I think I see," said Joan with a twinge of doubt.

"Well, all we have to do is to be darned sure that his own particular probability does not occur. Then he won't occur, and all of this will not occur, and we—"

"Look," said Tony excitedly, "it may be grasping at straws, but it seems to me that anything that is as certain as your friend . . . your, ah, grandson . . . Hedgerly claims shouldn't require a lot of outside aid."

Marie brightened, and then looked glum. "There's one thing that we all forget," she said unhappily. "We're speaking of predestiny as though we were a bunch of people going through the lines of a play. That may or may not be so. Let's face it, predestiny means that we may or may not know what our next move may be. We do not know, and there seems to be no way of finding out. Therefore whether or not our acts are all written need not take any of the fun out of life."

Tony faced her in surprise. "Just what are you advocating?" he demanded.

She reached up and took his hand. "Tony, never doubt that I love you. Yet Peter is a nice fellow, and had I met him first I'm reasonably sure that we could have been happy together."

"All right," nodded Tony. "Granted that love is a matter of coincidence, of the desirable factors of personality, propinquity, and propitiousness, so what?"

Marie looked unhappy. "He . . . Hedgerly . . . did win a nine-horse parlay, didn't he?"

"Yeah."

"He is here."

"Indubitably—and damnably!"

"Well," concluded Marie, "it is distasteful, but it seems ordained. And when—like going to the dentist—you're faced with something distasteful, there's little point in fuming over it. Do it—and forget it!"

Joan jumped to her feet. Then she sat down dejected. "Beating my head against the wall," she said. "All right. I give up."

Peter thought for a moment. "Look," he said brightly, "sometimes people must take chances. Sometimes people gotta ride close to the edge in order to gain safety. I suggest that we all elope to Yuma and have a double wedding!"

Tony advanced upon Peter with fire in his eye. "You're going to let that character get away with this?" he demanded. "I'll kill him first."

"No," said Peter shaking his head. "That won't remove the truth of his birth. What must be done is to prevent it in the first place!"

"By going through with it?" snorted Tony

"We can all hope for a last-minute reprieve," said Peter. "And until we're shotgunned into it, we can always have a double wedding with the cross-couples getting married. Y'see, Hedgerly claimed there hadn't been either a divorce nor a death-and-remarriage in the family for generations. Now the thing we gotta do is to get married to whom we want, and the only way we can even come close is to get close enough to a preacher to have him do the job. All at once and no one first. Finis, conclusion."

Tony nodded slowly. "Me, I've been half-psychopathically afraid of any Gentleman of the Cloth ever since Hedgerly turned up," he said. "So we can all go and be certain that the other is irreparably and thoroughly committing nonretractable matrimony. Then pooh for Grandson Hedgerly!"

Peter went to the telephone and dialed the number of the private airport. Ten minutes later they were on their way to the port, and when they arrived they looked carefully, but did not see the odious one. They paid no attention to the other plane idling in the background.

Hedgerly arrived as they took off into the blue. His plane was waiting and he leaped in quickly and told the pilot to follow the other plane.

"What's the hurry?" grinned the pilot.

Hedgerly smiled a sly smile. "It's a very long tale," he said. "But the summation of it all is that there are two couples in that ship who intend to get married."

"Double wedding, huh?"

"Right. That's what they intend."

"And are you the irate father, the angry brother, or the jilted lover?" grinned the pilot. He gunned the engine, and the plane roared down the tarmac and lofted. The pilot wasted no time in following the other plane. When the roar of the engine diminished for flying speed, the pilot turned to Hedgerly, who was obviously waiting for a semblance of silence before he spoke.

"I'm none of those," he said with a smile. "I'm merely a very interested character whose future dedepends upon seeing the right thing done."

"Such as?"

"Well, Party A wants to marry Party B while Party X wants to marry Party Y. This must not be. However, it must be that Party A marries Y whilst Party B marries X."

"Clear as a Raymond A. Chandler plot," grinned the pilot.

"Well, they've been trying to outwit me for quite some time," remarked Hedgerly. "Right at the present time, they're heading for this double wedding. The trouble is that they're so befuddled and worried about doing the wrong thing that that they'll pay no attention to what the preacher is saying?"

"Who does?" laughed the pilot.

"It would be better for their little plot if they did," said Hedgerly with a sly grin. "For, you see, I'm going to see that the preacher marries the proper parties."

"How?"

"I know how. You see, I've known about this plan of theirs for quite some time. And I know how it will come out. There will be a lot of confusion once this double ceremony is over and they think they're safe. While this confusion is going on, the preacher-man will be filling out the wedding certificates. He will, of course, have forgotten the correct names of the married ones. He will look up—and he will see me. I will tell him that I arrived a little late for the festive event, but can I be of help? Let's not annoy the happy people with details. You're confused? Then permit me to supply the details."

"Yeah?" said the pilot, interested.

"Then I'll supply the necessary details to make certain that the marriage certificate handed to Tony Grayson will state that he is solidly wedded to Joan Willson; conversely, the certificate handed to Peter Hedgerly will irrevocably state that he is to have and to hold until death do him part from Marie Baker. *Quod Erat Demonstrandum!*"

"Think there's a good probability of your getting away with it?"

"An excellent probability," stated Hedgerly. "This, chum, is it!"

Hedgerly arrived as the festivities came to a close. Quietly he slipped into the back door of the cottage and walked through the house until he came to the parson's study. There he waited until the gentleman arrived, and then he said:

"I am a relative of one of the fellows involved, sir. I seem to have been late for the big occasion, and I'd rather not interfere right at the present."

The parson looked up and nodded genially. "Not even to kiss the brides?"

"Later," grinned Hedgerly. "Doubtless the brides are being very well kissed right now?"

"Thoroughly. I see your point."

"Yeah," drawled Hedgerly with a smile. "I've often thought it was a strange way to start a fidelitous wedlock—for the bride to go around bestowing kisses on all and sundry males."

"My point exactly. The man to kiss the bride is her new husband and none other. You are a discerning man, sir. I don't know—"

"Hedgerly. A not too-distant relative of Peter Hedgerly."

"Then you know the names of all of them?"

"Known them for years."

"Fine. Then you can help me with their names. Mind?"

"Not at all," smiled Hedgerly. "They are Peter Hedgerly, Marie Baker, Anthony Grayson, and Joan Willson."

The parson put the names down and then turned to his desk. He picked up a rather heavy script-pen and started to write the names in on the dotted lines in a heavy ornate script. Finished, he arose and said: "Come on, Mr. Hedgerly." He waved the certificates, saying: "I like to write these things in with a heavy flourish. It seems to give them more color or taste or whatever than merely scrawling the names in common handwriting."

Hedgerly followed at a little distance. He wanted to see Peter's face when the young man read the certificate and found out who he was really married to. Furthermore, Hedgerly wanted to be there to point out who was wedded to whom and why.

Peter accepted the certificate and put his arm around Joan with a fatuous expression. Tony kissed Marie. They all started for the door.

Hedgerly ran forward, but the parson stopped him. "Hedgerly," he said, "you made one mistake. Never, never, never, try to hurl any woman at any man's head. They both resent it. And never, never, count on anything as being certain. And always, when you're trying to juggle the future, be certain of the true ancestry of those who have a definite part of it. I'll offer you a lift, Hedgerly, for I'm going your way, but not as far."

"But . . . but—"

Parson Hedgerly smiled. "Two couples," he said, "happily married to the right people—by their own son! Yeah, Hedgerly, you're not the only one who has a good probability of being. But your probability is slipping from decimal point to decimal point right now—and I doubt that you are even a shadow of your present self by the time we finish this trip back home."

THE END.

IN TIMES TO COME

Next month's cover--as forecast —will be Chesley Bonestell's painting of the Sun seen from space, with Mercury in transit. And on the newsstands, concurrently with this issue of *Astounding,* will be the issue of *Air Trails* carrying Bonestell's three other magnificent paintings, and R. S. Richardson's article, "New Paths to New Planets." Those interior color pictures *Air Trails* prints are, incidentally, available separately, and in batches, from the office.

The November cover will be a Rogers cover—he's working on it now. It's for a new three-part serial that came in just the other day. Something called . . . uhmmm . . . oh, yes! "Children Of The Lens," by an author we haven't heard from since he stopped making edible powders for doughnuts, and started making the more active kind, about December, 1941.

Doc Smith is back.

THE EDITOR.

CONQUEST...BY O. W. HOPKINSON, JR.

***Conquest** can be suicide; particularly the exploratory phase. But a very slow suicide, for very determined individuals—*

Illustrated by Cartier

The fat, old man gazed sadly at the empty container. He wiped the inside edge, applied the finger to his mouth and sucked. Sighing again, he went over to the waste lock, lifted the hinged lid and dropped the tin down the chute. The last of the *marlak*, that most delightful synthetic which had tasted like nothing else on Earth nor amid the stars. Now he'd have to get along on what was left. Of course, there were plenty of provisions. More than could possibly be eaten in what remained of living for him. But *marlak* was so good. His passion for it had existed ever since his youth. He remembered the wonderful years of his past, remembered dreamily, half living the experiences, tasting the goodies, comforts and luxuries. That was long, long ago.

His grossly corpulent body waddled out of the kitchen; the gravity switch at the door clicked and he jumped lazily up the central shaft,

reaching out chubby fingers and catching at a handle as he drifted within reach. Pulling himself easily into the control and observation room, the blister at the forward pole of the spherical metal ship, he paused a moment hanging there, then decided to leave the gravity off entirely. A moment later his mind changed and the control dial was shifted to mild, very mild. He sank gently to the floor of the room like some fantastic ballet performer, bounced slightly and settled the slight weight of his enormously fat body on the soles of his small feet. The waddle was not in evidence as he walked to the screen and sat down but the fat on his body moved faintly, flowingly like the surface of some jellied planet under the influence of far-off moons.

Relaxing himself comfortably he thrust out an arm, hesitated, and thought. I must be getting old, I really must, he told himself. With a smile and a grimace he touched the recording button instead of the synthetic musicale. Soft strains of long cherished songs flowed sweetly into the air, saturating it with sentimental lushness. He leaned back and closed his eyes, then opened them and gazed listlessly at the image on the viewer.

The planet bulged ominously, a brown-gray sphere floating ahead, a target of futility alone in the great loneliness of space. The solitude he felt dimly, but the quality of loneliness was had been missing in his nature. If he ever felt the slightest touch of imagination, the faintest shade of nostalgia, his mind turned easily to the image of those thousands upon thousands of glittering little balls, so like his own, inhabiting the outposts of space. They reached far into the depths and dimness of the universe, those tinseled specks which formed ever-expanding skins, great shells surrounding the mother planet. With those thoughts he would chuckle at the idea of being alone in his work. That was the way it had been once.

He twiddled the controls of the viewer, spotting the surface ahead of him in different locations, magnifying likely looking places, artificially enhanced vision searching, ever searching for movement, vegetation. A thrill still pulsed within him at this action. There hadn't been so many systems in his sector that he had grown bored, lost the sense of expectation that came with the envisioned discovery of a habitable world.

The ship spiraled closer, the planet grew, filled the screen, expanding like some ever inspiring monster. The beam roamed back and forth over the surface as the ship came in checking imagined motions. The place was a world of rocky landscape. An inland sea caught his attention and he hovered over it, dropping the analysis rod from twenty-five feet. He watched the indicators with something as close to enthusiasm as he was still capable of feeling.

The main dial mocked him motionlessly. The pointer quivered momentarily as he flicked the toggle then dropped, quiescent, to its former position. Beneath it the

series of electronic screens, small tubular eyes glowed, waned, remained inactive. From the idle pointer to the dark orifices his eyes jerked anxiously, blinking weakly despite their nictitum correctors. The ice-green glow of the lifers remained immobile, static.

Sterile.

The retraction mechanism operated and the antenna drew back into the ship like the eye stalk of a snail, the small bulb at the end socketing into a recess in the outside of the hull. There was too much of history, too much of bitter experience behind him for a feeling of great disappointment. Automatically he charted his course for the next satellite inward, turned the music recorder lower and slumped in his chair. He dozed.

Her arm crooked softly about his shoulder and neck, pressed gently.

"Three more years, Martin. Three more lovely years we have together, and then, if you pass the psychos—" Janet snuggled closer into his arms.

Martin James looked down at the curly, black hair nestled against him, hugged intimately and guided her through the sparse group of dancers. He dropped his head and whispered in her ear. "And if I pass, fifteen more. Just the two of us, living, laughing, loving." His arm tightened about the slender waist which tensed and relaxed to the beat of the music. "After that—"

"Don't think about it sweet," she murmured. "Don't ever think about it. Just the two of us together for the best part of our lives. No worry, no separation." She looked up at him, suddenly, disconcerted.

"You will pass, won't you darling?"

He smiled confidently.

"The first two years haven't been so hard, have they? It can't get much worse. And as for the psychos . . . well, my reactions have been perfect so far. I'm not worrying."

They continued to dance, his tall stalwart figure a ready foil for her shorter slenderness. Silently, intimately, a perfectly matched young couple they circled, lost in a world of dreams.

The wrinkled eyes opened blearily as the bell rang, a soft, muted tone throbbing faintly in the control room, more sensed than heard. He looked at the second of the system, observed the gaseous appearance of the surface and decided to pass it by. Then his optimism got the better of him. As the nebulous body drifted closer he watched half attentively, his brain still caught in a sticky mesh of partly wakened hebetude. His mind was once more retrogressing, thinking of Janet and the time they had spent together. Again there came to him clearly the scene that had been flashed so often in the amusement chamber; graduation day and the men lined up on the field listening to the address. The President of the Institute was speaking, telling them of the significance of their undertaking—as though they hadn't known it from the beginning.

"You know that you have been

chosen from many for this task. You know how you have been chosen and why. You are among those most fitted for the particular rigors you will have to undergo. Your minds have been strengthened and tested and strengthened again to withstand the long, arduous duties, the cracking strain which will be imposed upon them. These things you realize. Perhaps you realize also the responsibility that is yours as Ambassadors of Humanity. You know that you must be fit and ready at all times to present the greatness of yourselves and the race which has produced you.

"As Men from the Institute, you must appreciate, deep in your hearts, that you carry not the hope of this country" President Garth's voice was vibrant with unspoken message —"nor the hope of the world. You must bear upon your shoulders the burden of the Universe. Yours is the responsibility of carrying to whatever goals there may be the token of Civilization, the greatness of all Mankind." The firm, balanced voice had shaken perceptibly on the last few words.

Everyone was feeling the fear. It had grown in the latter years, grown so strong that the Institute itself was resting upon increasingly precarious foundations. The waves of opinion, beating upon the strength that was W.T.I. had no more effect than the waves of the ocean breaking against a rock bound littoral. And no less. Grains, pebbles were breaking off, cracks were spreading slowly in what was once an impenetrable surface.

A few members of the listening crowd outside the bounds of the field muttered. The Mystics were waxing stronger, more demonstrative. They couldn't be blamed ever with their warped and superstitious mental processes. For the outlook was dark, darker than anyone had ever conceived possible. The Mystics were growing stronger.

Idly he watched the dials, the electronic indicators which would detect the presence of one small molecule, which, giving off the short radiations of life from its essence could not help but betray itself. If anywhere in that cloudy mass there existed a group of the tiny building blocks of the universe combined into a pattern of self-determination in any shape or form, the antenna would find it, isolate it and send the news humming up the circuits. The delicate, ice-green luminescence would thicken, flash solidly and the pointer would waver and send a message of being, tell of the development, the approximate stage of evolution. He waited half-heartedly. There were small expectations from this ball of gas. Precious time was wasted; his life, precious to him, flowed swiftly on.

Fifteen years stretched before them endlessly. Years of love and life uncomplicated by the necessity for support. The world government took care of that, providing anything and everything for the group of idealists who were prepared to sacrifice half their lifetimes in the search.

Janet clutched at his arm, danced excitedly toward the 'copter.

"Now we can make some plans," she chattered, laughing. He laughed too, laughed with her in the full knowledge of freedom and the world at their feet.

They knew Earth from pole to pole. They traveled and lazed, swam in foreign seas, flew over exotic jungles, explored strange islands. Everywhere his insignia brought him instant recognition and respect. He paid for nothing, he owed no one.

On a sand strewn beach beneath a semitropical sun they lay, drinking in the warmth and good familiarity which he was soon to leave. Soon—a strange word which had had no meaning for him in the beginning. A touch of alien fear crawled into his mind only to be violently repulsed. Janet turned over and looked at him intently as he lay there, one arm thrown across his eyes.

"It would be wonderful if it turned out to be you," she said. "The feeling that would come to you, the knowledge that you had been chosen out of so many for the discovery." She drew closer to him. "If only I could be with you, go along, share it. Then I would know. As it is I can only dream. I can't even feel hope because—it will be too long."

He stretched out a hand, caressed the brown shoulder. "It is hard for you, that's true. But nothing can be done. You know that. The distance grows with each year. Farther and farther out we go, probing into the emptiness. Why, it will be twenty years before I start my work. Soon, they'll have to leave earlier, pick younger men. Some day, perhaps, they'll be able to provide for couples and then the flights can be made earlier for they will be much more endurable." She dropped her eyes as he looked at her fondly and patted her hand. "But, for the present this is the way things must end." There was silence for a moment, then the words continued, half murmuring. "Soon, they must start earlier, they must."

She gazed at him in astonishment. "You sound like a Mystic," she pouted with a return of spirit, "don't you believe?"

He smiled and embraced her. "If I didn't, would I be going?"

The cold, hard points of space looked down unblinking on him and his little shell. Like guardians of mystery they surrounded him, hostile, secretive. They seemed living beings, fierce, flame-tipped beasts that held the thing he wanted locked in the fiery cores of their hearts. If only I could be the one, he prayed passionately, if only I could send the message back to them.

Back to the infinite rear where waited the teeming millions of Earth. Willingly would the ship be turned into a coffin of death for himself that they might know at last. He grunted and eyed pathetically the red button standing by itself at the lower right-hand corner of the control board. Once he pushed it everything would be taken out of his hands. His life would be given, lit-

erally, with the motion. The button would bring into action automatic mechanism, switch on the acceleration that would drive the ship faster than his body could stand, back down the long years of dreary flight to come to rest on Earth. And in settling through the atmosphere it would flash the alarm all over the world he knew, telling all peoples that success had come.

"As you know this is the first Centennial of the Institute. Your class sets out amidst the celebration of a century. Let us hope that a particular importance may be attached to this Flight, that the enthusiasm which is associated with this moment may extend out with you, that one of you may be selected."

Martin wondered speculatively what the next centennial would be like. And the one after that. He shook himself angrily; traitorous thoughts.

"There are some among us who have expressed certain doubts, who are afraid—" another time, another President. Still the Flights went on.

He looked down at Janet, even now fresh and slim beside him as she had kept herself during the twenty years of their life together. She stood proudly on the field, her arm thrust through his, facing the speaker.

"The Institute has stood through one hundred years, unyielding, firm against all criticism. It has ignored the little whispers that seek to undermine the morale of men. Knowledge, technique, development—these are the ideals for which it stands.

Your face looks well-groomed, feels top-grade
When thrifty Thin Gillette's your blade!
It sails in at a merry clip—
Gives smooth, clean shaves with ease and zip!
Outlasts ordinary blades two to one
Gillette
BLADES
4 for 10c
Produced By The Maker Of The Famous Gillette Blue Blade

And the greatest of these is represented in yourselves and your purpose." Martin felt just the faintest trace of uneasiness at the pomposity of the speech. Get it over with, let us go. "We, as its representatives maintain these aims of progress and civilization alone and proud through the decades. A mighty bulwark against which the flood of fears and superstitions have swept to no avail. We shall continue in these traditions for so long as we shall endure."

"I'm so proud of you, so proud," whispered Janet.

The many couples turned to each other. Looking about him he saw that few had dropped from his class. Accident and death had taken light toll. Janet kissed him.

"If only I could know. If only I could go with you and be there."

There had been a faint chance in the beginning that she might be able to share his triumph. She might have lived until the ship roared through the atmosphere, dropped, set off its mad peal of announcement. But that hope had faded with the passing years along with the others which rattled in his old skull. He wondered sentimentally if she were still living. Perhaps; he had lasted this long.

Let's see now, how old was he? Nineteen years had passed since his emergence from under the influence of the serum. Nineteen years of ceaseless searching, stomach churning eagerness which had faded to a dull interest. And twenty more years under the influence of the injection, although those twenty had aged him only ten, or so the medics had predicted. That made him seventy-nine, an effective sixty-nine, an old man. She too, might be living, waiting. But when the years of return flight had passed, if there were a return, she would surely be gone. Gone, while he lingered, not even a living memory but a number in a book, forgotten, obliterated by the cataclysm of time, an animated monument to a dead ideal. His head drooped momentarily then was raised in senile defiance. He switched off the recorder angrily and tuned in the synthetic music. At least that brought no melancholy.

His hope and his faith trickled out of him like an ebbing tide and he tried to collect himself, an old fat man with the bitterness of age and frustration eaten deeply into the soft flabby face.

In the ever expanding spheres of little, rounded ships, this was being repeated and repeated and repeated. The concentric shells of succeeding Flights were loci of sparks of hope, bitterness, despair. Equally distributed throughout those stretching skins of discovery was a yearning so powerful that surely it must be consummated. Somewhere, not beyond the limit of man's life to explore there must be a warm, friendly environment that has produced a companion in the vast loneliness surrounding the solitary, life-ridden planet in the universe.

It must come soon for man has but three-score years and ten to roam.

THE END.

"HOBBYIST"...BY ERIC F. RUSSELL

***The** peculiar planet had one outstanding peculiarity of its life forms—one that was amazingly hard to spot. And the reason for it was even more peculiar—*

Illustrated by Cartier

The ship arced out of a golden sky and landed with a whoop and a wallop that cut down a mile of lush vegetation. Another half mile of growths turned black and drooped to ashes under the final flicker of the tail rocket blasts. That arrival was spectacular, full of verve, and worthy of four columns in any man's paper. But the nearest sheet was distant by a goodly slice of a lifetime, and there was none to record what this far corner of the cosmos regarded as the pettiest of events. So the ship squatted tired and still at the foremost end of the ashy blast-track and the sky glowed down and the green world brooded solemnly all around.

Within the transpex control dome, Steve Ander sat and thought things over. It was his habit to think things over carefully. Astronauts were not the impulsive daredevils

so dear to the stereopticon-loving public. They couldn't afford to be. The hazards of the profession required an infinite capacity for cautious, contemplative thought. Five minutes consideration had prevented many a collapsed lung, many a leaky heart, many a fractured frame. Steve valued his skeleton. He wasn't conceited about it and he'd no reason to believe it in any way superior to anyone else's skeleton. But he'd had it a long time, found it quite satisfactory, and had an intense desire to keep it—intact.

Therefore, while the tail tubes cooled off with their usual creaking contractions, he sat in the control seat, stared through the dome with eyes made unseeing by deep preoccupation, and performed a few thinks.

Firstly, he'd made a rough estimate of this world during his hectic approach. As nearly as he could judge, it was ten times the size of Terra. But his weight didn't seem abnormal. Of course, one's notions of weight tended to be somewhat wild when for some weeks one's own weight has shot far up or far down in between periods of weightlessness. The most reasonable estimate had to be based on muscular reaction. If you felt as sluggish as a Saturnian sloth, your weight was way up. If you felt as powerful as Angus McKittrick's bull, your weight was down.

Normal weight meant Terrestrial mass despite this planet's tenfold volume. That meant light plasma. And that meant lack of heavy elements. No thorium. No nickel. No nickel-thorium alloy. Ergo, no getting back. The Kingston-Kane atomic motors demanded fuel in the form of ten gauge nickel-thorium alloy wire fed directly into the vaporizers. Denatured plutonium would do, but it didn't occur in natural form, and it had to be made. He had three yards nine and a quarter inches of nickel-thorium left on the feed-spool. Not enough. He was here for keeps.

A wonderful thing, logic. You could start from the simple premise that when you were seated your behind was no flatter than usual, and work your way to the inevitable conclusion that you were a wanderer no more. You'd become a native. Destiny had you tagged as suitable for the status of oldest inhabitant.

Steve pulled an ugly face and said, "Darn!"

The face didn't have to be pulled far. Nature had given said pan a good start. That is to say, it wasn't handsome. It was a long, lean, nut-brown face with pronounced jaw muscles, prominent cheekbones, and a thin, hooked nose. This, with his dark eyes and black hair, gave him a hawklike appearance. Friends talked to him about tepees and tomahawks whenever they wanted him to feel at home.

Well, he wasn't going to feel at home any more; not unless this brooding jungle held intelligent life dopey enough to swap ten gauge nickel-thorium wire for a pair of old boots. Or unless some dopey search party was intelligent enough to pick this cosmic dust mote out of a cloud of motes, and took him back.

He estimated this as no less than a million-to-one chance. Like spitting at the Empire State hoping to hit a cent-sized mark on one of its walls.

Reaching for his everflo stylus and the ship's log, he opened the log, looked absently at some of the entries.

"Eighteenth day: The spatial convulsion has now flung me past rotal-range of Rigel. Am being tossed into uncharted regions.

"Twenty-fourth day: Arm of convulsion now tails back seven parsecs. Robot recorder now out of gear. Angle of throw changed seven times today.

"Twenty-ninth day: Now beyond arm of the convulsive sweep and regaining control. Speed far beyond range of the astrometer. Applying braking rockets cautiously. Fuel reserve: fourteen hundred yards.

"Thirty-seventh day: Making for planetary system now within reach."

He scowled, his jaw muscles lumped, and he wrote slowly and legibly, "Thirty-ninth day: Landed on planet unknown, primary unknown, galactic area standard reference and sector numbers unknown. No cosmic formations were recognizable when observed shortly before landing. Angles of offshoot and speed of transit not recorded, and impossible to estimate. Condition of ship; workable. Fuel reserve: three and one quarter yards."

Closing the log, he scowled again, rammed the stylus into its desk-grip, and muttered, "Now to check on the outside air and then see how the best girl's doing."

The Radson register had three simple dials. The first recorded outside pressure at thirteen point seven pounds, a reading he observed with much satisfaction. The second said that oxygen content was high. The third had a bi-colored dial, half white, half red, and its needle stood in the middle of the white.

"Breathable," he grunted, clipping down the register's lid. Crossing the tiny control room, he slid aside a metal panel, looked into the padded compartment behind. "Coming out, Beauteous?" he asked.

"Steve loves Laura?" inquired a plaintive voice.

"You bet he does!" he responded with becoming passion. He shoved an arm into the compartment, brought out a large, gaudily colored macaw. "Does Laura love Steve?"

"Hey-hey!" cackled Laura harshly. Climbing up his arm, the bird perched on his shoulder. He could feel the grip of its powerful claws. It regarded him with a beady and brilliant eye, then rubbed its crimson head against his left ear. "Hey-hey! Time flies!"

"Don't mention it," he reproved. "There's plenty to remind me of the fact without you chipping in."

Reaching up, he scratched her poll while she stretched and bowed with absurd delight. He was fond of Laura. She was more than a pet. She was a bona fide member of the crew, issued with her own rations and drawing her own pay. Every probe ship had a crew of two: one man, one macaw. When he'd first heard of it, the practice had seemed

crazy—but when he got the reasons, it made sense.

"Lonely men, probing beyond the edge of the charts, get queer psychological troubles. They need an anchor to Earth. A macaw provides the necessary companionship—and more! It's the space-hardiest bird we've got, its weight is negligible, it can talk and amuse, it can fend for itself when necessary. On land, it will often sense dangers before you do. Any strange fruit or food it may eat is safe for you to eat. Many a man's life has been saved by his macaw. Look after yours, my boy, and it'll look after you!"

Yes, they looked after each other, Terrestrials both. It was almost a symbiosis of the spaceways. Before the era of astronavigation nobody had thought of such an arrangement, though it had been done before. Miners and their canaries.

Moving over to the miniature air lock, he didn't bother to operate the pump. It wasn't necessary with so small a difference between internal and external pressures. Opening both doors, he let a little of his higher-pressured air sigh out, stood on the rim of the lock, jumped down. Laura fluttered from his shoulder as he leaped, followed him with a flurry of wings, got her talons into his jacket as he staggered upright.

The pair went around the ship, silently surveying its condition. Front braking nozzles O.K., rear steering flares O.K., tail propulsion tubes O.K. All were badly scored but still usable. The skin of the vessel likewise was scored but intact. Three months supply of food and maybe a thousand yards of wire could get her home, theoretically. But only theoretically, Steve had no delusions about the matter. The odds were still against him even if given the means to move. How do you navigate from you-don't-know-where to you-don't-know-where? Answer; you stroke a rabbit's foot and probably arrive you-don't-know-where-else.

"Well," he said, rounding the tail, "it's something in which to live. It'll save us building a shanty. Way back on Terra they want fifty thousand smackers for an all-metal, streamlined bungalow, so I guess we're mighty lucky. I'll make a garden here, and a rockery there, and build a swimming pool out back. You can wear a pretty frock and do all the cooking."

"Yawk!" said Laura derisively.

Turning, he had a look at the nearest vegetation. It was of all heights, shapes and sizes, of all shades of green with a few tending toward blueness. There was something peculiar about the stuff but he was unable to decide where the strangeness lay. It wasn't that the growths were alien and unfamiliar—one expected that on every new world—but an underlying something which they shared in common. They had a vague, shadowy air of being not quite right in some basic respect impossible to define.

A plant grew right at his feet. It was green in color, a foot high, and monocotyledonous. Looked at as a thing in itself, there was nothing

wrong with it. Near to it flourished a bush of darker hue, a yard high, with green, firlike needles in lieu of leaves, and pale, waxy berries scattered over it. That, too, was innocent enough when studied apart from its neighbors. Beside it grew a similar plant, differing only in that its needles were longer and its berries a bright pink. Beyond these towered a cactuslike object dragged out of somebody's drunken dreams, and beside it stood an umbrella-frame which had taken root and produced little purple pods. Individually, they were acceptable. Collectively, they made the discerning mind search anxiously for it knew not what.

That eerie feature had Steve stumped. Whatever it was, he couldn't nail it down. There was something stranger than the mere strangeness of new forms of plant life, and that was all. He dismissed the problem with a shrug. Time enough to trouble about such matters after he'd dealt with others more urgent such as, for example, the location and purity of the nearest water supply.

A mile away lay a lake of some liquid that might be water. He'd seen it glittering in the sunlight as he'd made his descent, and he'd tried to land fairly near to it. If it wasn't water, well, it'd be just his tough luck and he'd have to look some place else. At worst, the tiny fuel reserve would be enough to permit one circumnavigation of the planet before the ship became pinned down forever. Water he must have if he wasn't going to end up imitating the mummy of Rameses the Second.

Reaching high, he grasped the rim of the port, dexterously muscled himself upward and through it. For a minute he moved around inside the ship, then reappeared with a four-gallon freezocan which he tossed to the ground. Then he dug out his popgun, a belt of explosive shells, and let down the folding ladder from lock to surface. He'd need that ladder. He could muscle himself up through a hole seven feet high, but not with fifty pounds of can and water.

Finally, he locked both the inner and outer air lock doors, skipped down the ladder, picked up the can. From the way he'd made his landing the lake should be directly bow-on relative to the vessel, and somewhere the other side of those distant trees. Laura took a fresh grip on his shoulder as he started off. The can swung from his left hand. His right hand rested warily on the gun. He was perpendicular on this world instead of horizontal on another because, on two occasions, his hand had been ready on the gun, and because it was the most nervous hand he possessed.

The going was rough. It wasn't so much that the terrain was craggy as the fact that impeding growths got in his way. At one moment he was stepping over an ankle-high shrub, the next he was facing a burly plant struggling to become a tree. Behind the plant would be a creeper, then a natural zareba of thorns, a fuzz of fine moss, followed by a

giant fern. Progress consisted of stepping over one item, ducking beneath a second, going around a third, and crawling under a fourth.

It occurred to him, belatedly, that if he'd planted the ship tail-first to the lake instead of bow-on, or if he'd let the braking rockets blow after he'd touched down, he'd have saved himself much twisting and dodging. All this obstructing stuff would have been reduced to ashes for at least half the distance to the lake together with any venomous life it might conceal.

That last thought rang like an alarm bell within his mind just as he doubled up to pass a low-swung creeper. On Venus were creepers that coiled and constricted, swiftly, viciously. Macaws played merry hell if taken within fifty yards of them. It was a comfort to know that, this time, Laura was riding his shoulder unperturbed—but he kept the hand on the gun.

The elusive peculiarity of the planet's vegetation bothered him all the more as he progressed through it. His inability to discover and name this unnamable queerness nagged at him as he went on. A frown of self-disgust was on his lean face when he dragged himself free of a clinging bush and sat on a rock in a tiny clearing.

Dumping the can at his feet, he glowered at it and promptly caught a glimpse of something bright and shining a few feet beyond the can. He raised his gaze. It was then he saw the beetle.

The creature was the biggest of its kind ever seen by human eyes. There were other things bigger, of course, but not of this type. Crabs, for instance. But this was no crab. The beetle ambling purposefully across the clearing was large enough to give any crab a severe inferiority complex, but it was a genuine, twenty-four karat beetle. And a beautiful one. Like a scarab.

Except that he clung to the notion that little bugs were vicious and big ones companionable, Steve had no phobia about insects. The amiability of large ones was a theory inherited from schoolkid days when he'd been the doting owner of a three-inch stag-beetle afflicted with the name of Edgar.

So he knelt beside the creeping giant, placed his hand palm upward in its path. It investigated the hand with waving feelers, climbed onto his palm, paused there ruminatively. It shone with a sheen of brilliant metallic blue and it weighed about three pounds. He jogged it on his hand to get its weight, then put it down, let it wander on. Laura watched it go with a sharp but incurious eye.

"*Scarabaeus Anderii,*" Steve said with glum satisfaction. "I pin my name on him—but nobody'll ever know it!"

"Dinna fash y'rsel'!" shouted Laura in a hoarse voice imported straight from Aberdeen. "Dinna fash! Stop chunnerin', wumman! Y' gie me a pain ahint ma sporran! Dinna—"

"Shut up!" Steve jerked his shoulder, momentarily unbalancing the bird. "Why d'you pick up that

barbaric dialect quicker than anything else, eh?"

"McGillicuddy," shrieked Laura with ear-splitting relish. "McGilli-Gilli-Gillicuddy! The great black —!" It ended with a word that pushed Steve's eyebrows into his hair and surprised even the bird itself. Filming its eyes with amazement, it tightened its claw-hold on his shoulder, opened the eyes, emitted a couple of raucous clucks, and joyfully repeated, "The great black —"

It didn't get the chance to complete the new and lovely word. A

violent jerk of the shoulder unseated it in the nick of time and it fluttered to the ground, squawking protestingly. *Scarabaeus Anderii* lumbered out from behind a bush, his blue armor glistening as if freshly polished, and stared reprovingly at Laura.

Then something fifty yards away released a snort like the trump of doom and took one step that shook the earth. *Scarabaeus Anderii* took refuge under a projecting root. Laura made an agitated swoop for Steve's shoulder and clung there desperately. Steve's gun was out and pointing northward before the bird had found its perch. Another step. The ground quivered.

Silence for awhile. Steve continued to stand like a statue. Then came a monstrous whistle more forceful than that of a locomotive blowing off steam. Something squat and wide and of tremendous length charged headlong through the half-concealing vegetation while the earth trembled beneath its weight.

Its mad onrush carried it blindly twenty yards to Steve's right, the gun swinging to cover its course, but not firing. Steve caught an extended glimpse of a slate-gray bulk with a serrated ridge on its back which, despite the thing's pace, took long to pass. It seemed several times the length of a fire ladder.

Bushes were flung roots topmost and small trees whipped aside as the creature pounded grimly onward in a straight line which carried it far past the ship and into the dim distance. It left behind a tattered swathe wide enough for a first-class road. Then the reverberations of its mighty tonnage died out, and it was gone.

Steve used his left hand to pull out a handkerchief and wipe the back of his neck. He kept the gun in his right hand. The explosive shells in that gun were somewhat wicked; any one of them could deprive a rhinoceros of a hunk of meat weighing two hundred pounds. If a man caught one, he just strewed himself over the landscape. By the looks of that slate-colored galloper, it would need half a dozen shells to feel incommoded. A seventy-five millimeter bazooka would be more effective for kicking it in the back teeth, but probe ship boys don't tote around such artillery. Steve finished the mopping, put the handkerchief back, picked up the can.

Laura said pensively, "I want my mother."

He scowled, made no reply, set out toward the lake. Her feathers still ruffled, Laura rode his shoulder and lapsed into surly silence.

The stuff in the lake was water, cold, faintly green and a little bitter to the taste. Coffee would camouflage the flavor. If anything, it might improve the coffee since he liked his java bitter, but the stuff would have to be tested before absorbing it in any quantity. Some poisons were accumulative. It wouldn't do to guzzle gayly while building up a death-dealing reserve of lead, for instance. Filling the freezocan, he lugged it to the ship in hundred yard stages. The swathe helped; it made an easier path to

within short distance of the ship's tail. He was perspiring freely by the time he reached the base of the ladder.

Once inside the vessel, he relocked both doors, opened the air vents, started the auxiliary lighting-set and plugged in the percolator, using water out of his depleted reserve supply. The golden sky had dulled to orange, with violet streamers creeping upward from the horizon. Looking at it through the transpex dome, he found that the perpetual haze still effectively concealed the sinking sun. A brighter area to one side was all that indicated its position. He'd need his lights soon.

Pulling out the collapsible table, he jammed its supporting leg into place, plugged into its rim the short rod which was Laura's official seat. She claimed the perch immediately, watched him beadily as he set out her meal of water, melon seeds, sunflower seeds, pecans and unshelled oleo nuts. Her manners were anything but ladylike and she started eagerly, without waiting for him.

A deep frown lay across his brown, muscular features as he sat at the table, poured out his coffee and commenced to eat. It persisted through the meal, was still there when he lit a cigarette and stared speculatively up at the dome.

Presently, he murmured, "I've seen the biggest bug that ever was. I've seen a few other bugs. There were a couple of little ones under a creeper. One was long and brown and many-legged, like an earwig. The other was round and black, with little red dots on its wing cases. I've seen a tiny purple spider and a tinier green one of different shape, also a bug that looked like an aphid. But not an ant."

"Ant, ant," hooted Laura. She dropped a piece of oleo nut, climbed down after it. "Yawk!" she added from the floor.

"Nor a bee."

"Bee," echoed Laura, companionably. "Bee-ant. Laura loves Steve."

Still keeping his attention on the dome, he went on, "And what's cockeyed about the plants is equally cockeyed about the bugs. I wish I could place it. Why can't I? Maybe I'm going nuts already."

"Laura loves nuts."

"I know it, you technicolored belly!" said Steve rudely.

And at that point night fell with a silent bang. The gold and orange and violet abruptly were swamped with deep, impenetrable blackness devoid of stars or any random gleam. Except for greenish glowings on the instrument panel, the control room was stygian, with Laura swearing steadily on the floor.

Putting out a hand, Steve switched on the indirect lighting. Laura got to her perch with the rescued titbit, concentrated on the job of dealing with it and let him sink back into his thoughts.

"*Scarabaeus Anderii* and a pair of smaller bugs and a couple of spiders, all different. At the other end of the scale, that gigantosaurus. But no ant, or bee. Or rather, no ants, no bees." The switch from singular to plural stirred his back hairs

queerly. In some vague way, he felt that he'd touched the heart of the mystery. "No ant—no ants," he thought. "No bee—no bees." Almost he had it—but still it evaded him.

Giving it up for the time being, he cleared the table, did a few minor chores. After that, he drew a standard sample from the freezo-can, put it through its paces. The bitter flavor he identified as being due to the presence of magnesium sulphate in quantity far too small to prove embarrassing. Drinkable—that was something! Food, drink and shelter were the three essentials of survival. He'd enough of the first for six or seven weeks. The lake and the ship were his remaining guarantees of life.

Finding the log, he entered the day's report, bluntly, factually, without any embroidery. Partway through, he found himself stuck for a name for the planet. *Ander,* he decided, would cost him dear if the million-to-one chance put him back among the merciless playmates of the Probe Service. O.K. for a bug, but not for a world. *Laura* wasn't so hot, either—especially when you knew Laura. It wouldn't be seemly to name a big, gold planet after an oversized parrot. Thinking over the golden aspect of this world's sky, he hit upon the name of *Oro*, promptly made the christening authoritative by entering it in his log.

By the time he'd finished, Laura had her head buried deep under one wing. Occasionally she teetered and swung erect again. It always fascinated him to watch how her balance was maintained even in her slumbers. Studying her fondly, he remembered that unexpected addition to her vocabulary. This shifted his thoughts to a fiery-headed and fierier-tongued individual named Menzies, the sworn foe of another volcano named McGillicuddy. If ever the opportunity presented itself, he decided, the educative work of said Menzies was going to be rewarded with a bust on the snoot.

Sighing, he put away the log, wound up the forty-day chronometer, opened his folding bunk and lay down upon it. His hand switched off the lights. Ten years back, a first landing would have kept him awake all night in dithers of excitement. He'd got beyond that now. He'd done it often enough to have grown phlegmatic about it. His eyes closed in preparation for a good night's sleep, and he did sleep—for two hours.

What brought him awake within that short time he didn't know, but suddenly he found himself sitting bolt upright on the edge of the bunk, his ears and nerves stretched to their utmost, his legs quivering in a way they'd never done before. His whole body fizzed with that queer mixture of palpitation and shock which follows narrow escape from disaster.

This was something not within previous experience. Sure and certain in the intense darkness, his hand sought and found his gun. He cuddled the butt in his palm while his mind strove to recall a possible

nightmare, though he knew he was not given to nightmares.

Laura moved restlessly on her perch, not truly awake, yet not asleep, and this was unusual in her.

Rejecting the dream theory, he stood up on the bunk, looked out through the dome. Blackness, the deepest, darkest, most impenetrable backness it was possible to conceive. And silence! The outside world slumbered in the blackness and the silence as in a sable shroud.

Yet never before had he felt so wide awake in this, his normal sleeping time. Puzzled, he turned slowly round to take in the full circle of unseeable view, and at one point he halted. The surrounding darkness was not complete. In the distance beyond the ship's tail moved a tall, stately glow. How far off it might be was not possible to estimate, but the sight of it stirred his soul and caused his heart to leap.

Uncontrollable emotions were not permitted to master his disciplined mind. Narrowing his eyes, he tried to discern the nature of the glow while his mind sought the reason why the mere sight of it should make him twang like a harp. Bending down, he felt at the head of the bunk, found a leather case, extracted a pair of powerful night glasses. The glow was still moving, slowly, deliberately, from right to left. He got the glasses on it, screwed the lenses into focus, and the phenomenon leaped into closer view.

The thing was a great column of golden haze much like that of the noonday sky except that small, intense gleams of silver sparkled within it. It was a shaft of lustrous mist bearing a sprinkling of tiny stars. It was like nothing known to or recorded by any form of life lower than the gods. But was it life?

It moved, though its mode of locomotion could not be determined. Self-motivation is the prime symptom of life. It could be life, conceivably though not credibly, from the Terrestrial viewpoint. Consciously, he preferred to think it a strange and purely local feature comparable with Saharan sand-devils. Subconsciously, he knew it was life, tall and terrifying.

He kept the glasses on it while slowly it receded into the darkness, foreshortening with increasing distance and gradually fading from view. To the very last the observable field shifted and shuddered as he failed to control the quiver in his hands. And when the sparkling haze had gone, leaving only a pall over his lenses, he sat down on the bunk and shivered with eerie cold.

Laura was dodging to and fro along her perch, now thoroughly awake and agitated, but he wasn't inclined to switch on the lights and make the dome a beacon in the night. His hand went out, feeling for her in the darkness, and she clambered eagerly onto his wrist, thence to his lap. She was fussy and demonstrative, pathetically yearning for comfort and companionship. He scratched her poll and fondled her while she pressed close against his chest with funny little crooning noises. For some time he soothed her and, while doing it, fell asleep.

Gradually he slumped backward on the bunk. Laura perched on his forearm, clucked tiredly, put her head under a wing.

There was no further awakening until the outer blackness disappeared and the sky again sent its golden glow pouring through the dome. Steve got up, stood on the bunk, had a good look over the surrounding terrain. It remained precisely the same as it had been the day before. Things stewed within his mind while he got his breakfast; especially the jumpiness he'd experienced in the nighttime. Laura also was subdued and quiet. Only once before had she been like that—which was when he'd traipsed through the Venusian section of the Panplanetary Zoo and had shown her a crested eagle. The eagle had stared at her with contemptuous dignity.

Though he'd all the time in his life, he now felt a peculiar urge to hasten. Getting the gun and the freezocan, he made a full dozen trips to the lake, wasting no minutes, nor stopping to study the still enigmatic plants and bugs. It was late in the afternoon by the time he'd filled the ship's fifty-gallon reservoir, and had the satisfaction of knowing that he'd got a drinkable quota to match his food supply.

There had been no sign of gigantosaurus or any other animal. Once he'd seen something flying in the far distance, birdlike or batlike. Laura had cocked a sharp eye at it but betrayed no undue interest. Right now she was more concerned with a new fruit. Steve sat in the rim of the outer lock door, his legs dangling, and watched her clambering over a small tree thirty yards away. The gun lay in his lap; he was ready to take a crack at anything which might be ready to take a crack at Laura.

The bird sampled the tree's fruit, a crop resembling blue-shelled lychee nuts. She ate one with relish, grabbed another. Steve lay back in the lock, stretched to reach a bag, then dropped to the ground and went across to the tree. He tried a nut. Its flesh was soft, juicy, sweet and citrous. He filled the bag with the fruit, slung it into the ship.

Nearby stood another tree, not quite the same, but very similar. It bore nuts like the first except that they were larger. Picking one, he offered it to Laura who tried it, spat it out in disgust. Picking a second, he slit it, licked the flesh gingerly. As far as he could tell, it was the same. Evidently he couldn't tell far enough: Laura's diagnosis said it was not the same. The difference, too subtle for him to detect, might be sufficient to roll him up like a hoop and keep him that shape to the unpleasant end. He flung the thing away, went back to his seat in the lock, and ruminated.

That elusive, nagging feature of Oro's plants and bugs could be narrowed down to these two nuts. He felt sure of that. If he could discover why—parrotwise—one nut was a nut while the other nut was not, he'd have his finger right on the secret. The more he thought about those similar fruits the more he felt that, in sober fact, his finger was on

the secret already—but he lacked the power to lift it and see what lay beneath.

Tantalizingly, his mulling-over the subject landed him the same place as before; namely, nowhere. It got his dander up, and he went back to the trees, subjected both to close examination. His sense of sight told him that they were different individuals of the same species. Laura's sense of whatchamacallit insisted that they were different species. Ergo, you can't believe the evidence of your eyes. He was aware of that fact, of course, since it was a platitude of the spaceways, but when you couldn't trust your optics it was legitimate to try to discover just why you couldn't trust 'em. And he couldn't discover even that!

It soured him so much that he returned to the ship, locked its doors, called Laura back to his shoulder and set off on a tailward exploration. The rules of first landings were simple and sensible. Go in slowly, come out quickly, and remember that all we want from you is evidence of suitability for human life. Thoroughly explore a small area rather than scout a big one—the mapping parties will do the rest. Use your ship as a base and centralize it where you can live—don't move it unnecessarily. Restrict your trips to a radius representing daylight-reach and lock yourself in after dark.

Was Oro suitable for human life? The unwritten law was that you don't jump to conclusions and say, "Of course! I'm still living, aren't I?" Cameron, who'd plonked his ship on Mithra, for instance, thought he'd found paradise until, on the seventeenth day, he'd discovered the fungoid plague. He'd left like a bat out of hell and had spent three sweaty, swearing days in the Lunar Purification Plant before becoming fit for society. The authorities had vaporized his ship. Mithra had been taboo ever since. Every world a potential trap baited with scenic delight. The job of the Probe Service was to enter the traps and jounce on the springs. Another dollop of real estate for Terra—if nothing broke your neck.

Maybe Oro was loaded for bear. The thing that walked in the night, Steve mused, bore awful suggestion of nonhuman power. So did a waterspout, and whoever heard of anyone successfully wrestling with a waterspout? If this Oro-spout were sentient, so much the worse for human prospects. He'd have to get the measure of it, he decided, even if he had to chase it through the blank avenues of night. Plodding steadily away from the tail, gun in hand, he pondered so deeply that he entirely overlooked the fact that he wasn't on a pukka probe job anyway, and that nothing else remotely human might reach Oro in a thousand years. Even space-boys can be creatures of habit. Their job: to look for death; they were liable to go on looking long after the need had passed, in bland disregard of the certainty that if you look for a thing long enough, ultimately you find it!

The ship's chronometer had given him five hours to darkness. Two and a half hours each way; say ten miles out and ten back. The water had consumed his time. On the morrow, and henceforth, he'd increase the radius to twelve and take it easier.

Then all thoughts fled from his mind as he came to the edge of the vegetation. The stuff didn't dribble out of existence with hardy spurs and offshoots fighting for a hold in suddenly rocky ground. It stopped abruptly, in light loam, as if cut off with a machete, and from where it stopped spread a different crop. The new growths were tiny and crystalline.

He accepted the crystalline crop without surprise, knowing that novelty was the inevitable feature of any new locale. Things were ordinary only by Terrestrial standards. Outside of Terra, nothing was supernormal or abnormal except insofar as they failed to jibe with their own peculiar conditions. Besides, there were crystalline growths on Mars. The one unacceptable feature of the situation was the way in which vegetable growths ended and crystalline ones began. He stepped back to the verge and made another startled survey of the borderline. It was so straight that the sight screwed his brain around. Like a field. A cultivated field. Dead straightness of that sort couldn't be other than artificial. Little beads of moisture popped out on his back.

Squatting on the heel of his right boot, he gazed at the nearest crystals and said to Laura, "Chicken, I think these things got planted. Question is, who planted 'em?"

"McGillicuddy," suggested Laura brightly.

Putting out a finger, he flicked the crystal sprouting near the toe of his boot, a green, branchy object an inch high.

The crystal vibrated and said, *"Zing!"* in a sweet, high voice.

He flicked its neighbor, and that said, *"Zang!"* in lower tone.

He flicked a third. It emitted no note, but broke into a thousand shards.

Standing up, he scratched his head, making Laura fight for a claw-hole within the circle of his arm. One zinged and one zanged and one returned to dust. Two nuts. Zings and zangs and nuts. It was right in his grasp if only he could open his hand and look at what he'd got.

Then he lifted his puzzled and slightly ireful gaze, saw something fluttering erratically across the crystal field. It was making for the vegetation. Laura took off with a raucous cackle, her blue and crimson wings beating powerfully. She swooped over the object, frightening it so low that it dodged and sideslipped only a few feet above Steve's head. He saw that it was a large butterfly, frill-winged, almost as gaudy as Laura. The bird swooped again, scaring the insect but not menacing it. He called her back, set out to cross the area ahead. Crystals crunched to powder under his heavy boots as he tramped on.

Half an hour later he was toiling up a steep, crystal-coated slope when

his thoughts suddenly jelled and he stopped with such abruptness that Laura spilled from his shoulder and perforce took to wing. She beat round in a circle, came back to her perch, made bitter remarks in an unknown language.

"One of this and one of that," he said. "No twos or threes or dozens. Nothing I've seen has repeated itself. There's only one gigantosaurus, only one *Scarabaeus Anderii*, only one of every other danged thing. Every item is unique, original, and an individual creation in its own right. What does that suggest?"

"McGillicuddy," offered Laura.

"For Pete's sake, forget McGillicuddy."

"For Pete's sake, for Pete's sake," yelled Laura, much taken by the phrase. "The great black—"

Again he upset her in the nick of time, making her take to flight while he continued talking to himself. "It suggests constant and all-pervading mutation. Everything breeds something quite different from itself and there aren't any dominant strains." He frowned at the obvious snag in this theory. "But how the blazes does anything breed? What fertilizes which?"

"McGilli—," began Laura, then changed her mind and shut up.

"Anyway, if nothing breeds true, it'll be tough on the food problem," he went on. "What's edible on one plant may be a killer on its offspring. Today's fodder is tomorrow's poison. How's a farmer to know what he's going to get? Hey-hey, if I'm guessing right, this planet won't support a couple of hogs."

"No, sir. No hogs. Laura loves hogs."

"Be quiet," he snapped. "Now, what shouldn't support a couple of hogs demonstrably does support gigantosaurus—and any other fancy animiles which may be mooching around. It seems crazy to me. On Venus or any other place full of consistent fodder, gigantosaurus would thrive, but here, according to my calculations, the big lunk has no right to be alive. He ought to be dead."

So saying, he topped the rise and found the monster in question sprawling right across the opposite slope. It *was* dead.

The way in which he determined its deadness was appropriately swift, simple and effective. Its enormous bulk lay draped across the full length of the slope and its dragon-head, the size of a lifeboat, pointed toward him. The head had two dull, lackluster eyes like dinner plates. He planted a shell smack in the right eye and a sizable hunk of noggin promptly splashed in all directions. The body did not stir.

There was a shell ready for the other eye should the creature leap to frantic, vengeful life, but the mighty hulk remained supine.

His boots continued to desiccate crystals as he went down the slope, curved a hundred yards off his route to get around the corpse, and trudged up the farther rise. Momentarily, he wasn't much interested in the dead beast. Time was short and he could come again tomorrow,

bringing a full-color stereoscopic camera with him. Gigantosaurus would go on record in style, but would have to wait.

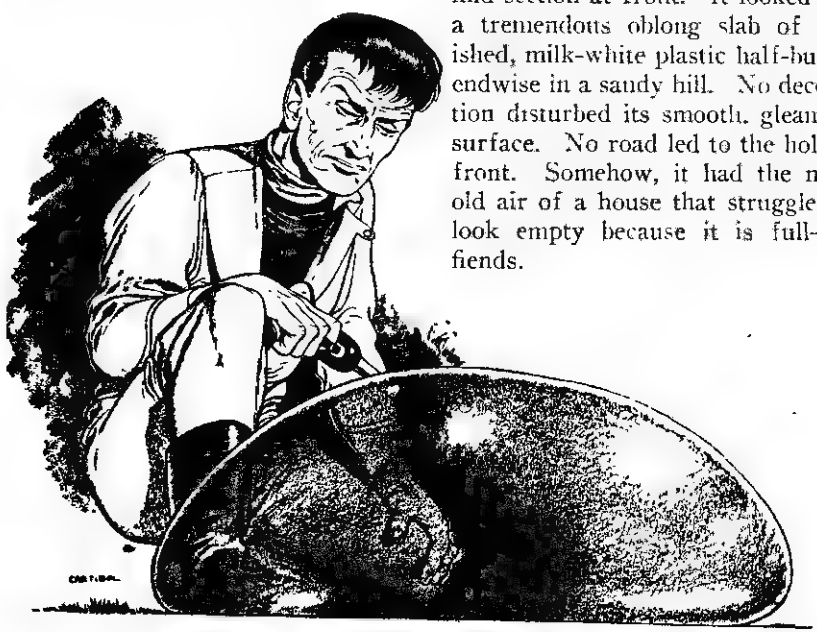
This second rise was a good deal higher, and more trying a climb. Its crest represented the approximate limit of this day's trip, and he felt anxious to surmount it before turning back. Humanity's characteristic urge to see what lay over the hill remained as strong as on the day determined ancestors topped the Rockies. He had to have a look, firstly because elevation gave range to the vision, and secondly because of that prowler in the night—and, nearly as he could estimate, the prowler had gone down behind this rise. A column of mist, sucked down from the sky, might move around aimlessly, going nowhere, but instinct maintained that this had been no mere column of mist, and that it was going somewhere.

Where?

Out of breath, he pounded over the crest, looked down into an immense valley, and found the answer.

The crystal growths gave out on the crest, again in a perfectly straight line. Beyond them the light loam, devoid of rock, ran gently down to the valley and up the farther side. Both slopes were sparsely dotted with queer, jellylike lumps of matter which lay and quivered beneath the sky's golden glow.

From the closed end of the valley jutted a great, glistening fabrication, flat-roofed, flat-fronted, with a huge, square hole gaping in its mid-section at front. It looked like a tremendous oblong slab of polished, milk-white plastic half-buried endwise in a sandy hill. No decoration disturbed its smooth, gleaming surface. No road led to the hole in front. Somehow, it had the new-old air of a house that struggles to look empty because it is full—of fiends.



Steve's back hairs prickled as he studied it. One thing was obvious —Oro bore intelligent life. One thing was possible—the golden column represented that life. One thing was probable—fleshly Terrestrials and hazy Orons would have difficulty in finding a basis for friendship and co-operation.

Whereas enmity needs no basis.

Curiosity and caution pulled him opposite ways. One urged him down into the valley while the other drove him back, back, while yet there was time. He consulted his watch. Less than three hours to go, within which he had to return to the ship, enter the log, prepare supper. That milky creation was at least two miles away, a good hour's journey there and back. Let it wait. Give it another day and he'd have more time for it, with the benefit of needful thought betweentimes.

Caution triumphed. He investigated the nearest jellyblob. It was flat, a yard in diameter, green, with bluish streaks and many tiny bubbles hiding in its semitransparency. The thing pulsated slowly. He poked it with the toe of his boot, and it contracted, humping itself in the middle, then sluggishly relaxed. No amoeba, he decided. A low form of life, but complicated withal. Laura didn't like the object. She skittered off as he bent over it, vented her anger by bashing a few crystals.

This jello dollop wasn't like its nearest neighbor, or like any other. One of each, only one. The same rule: one butterfly of a kind, one bug, one plant, one of these quivering things.

A final stare at the distant mystery down in the valley, then he retraced his steps. When the ship came into sight he speeded up like a gladsome voyager nearing home. There were new prints near the vessel, big, three-toed, deeply-impressed spoor which revealed that something large, heavy and two-legged had wandered past in his absence. Evidently an animal, for nothing intelligent would have meandered on so casually without circling and inspecting the nearby invader from space. He dismissed it from his mind. There was only one thing umbob, he felt certain of that.

Once inside the ship, he relocked the doors, gave Laura her feed, ate his supper. Then he dragged out the log, made his day's entry, had a look around from the dome. Violet streamers once more were creeping upward from the horizon. He frowned at the encompassing vegetation. What sort of stuff had bred all this in the past? What sort of stuff would this breed in the future? How did it progenerate, anyway?

Wholesale radical mutation presupposed modification of genes by hard radiation in persistent and considerable blasts. You shouldn't get hard radiation on lightweight planets —unless it poured in from the sky. Here, it didn't pour from the sky, or from any place else. In fact, there wasn't any.

He was pretty certain of that fact because he'd a special interest in it and had checked up on it. Hard radiation betokened the presence of

radioactive elements which, at a pinch, might be usable as fuel. The ship was equipped to detect such stuff. Among the junk was a cosmiray counter, a radium hen, and a gold-leaf electroscope. The hen and the counter hadn't given so much as one heartening cluck, in fact the only clucks had been Laura's. The electroscope he'd charged on landing and its leaves still formed an inverted vee. The air was dry, ionization negligible, and the leaves didn't look likely to collapse for a week.

"Something's wrong with my theorizing," he complained to Laura. "My think-stuff's not doing its job."

"Not doing its job," echoed Laura faithfully. She cracked a pecan with a grating noise that set his teeth on edge. "I tell you it's a hoodoo ship. I won't sail. No, not even if you pray for me. I won't, I won't, I won't. Nope. Nix. Who's drunk? That hairy Lowlander Mc "

"Laura!" he said sharply.

"Gillicuddy," she finished with bland defiance. Again she rasped his teeth. "Rings bigger'n Saturn's. I saw them myself. Who's a liar? Yawk! She's down in Grayway Bay, on Tethis. Boy, what a torso!"

He looked at her hard and said, "You're nuts!"

"Sure! Sure, pal! Laura loves nuts. Have one on me."

"O.K.," he accepted, holding out his hand.

Cocking her colorful pate, she pecked at his hand, gravely selected a pecan and gave it to him. He cracked it, chewed on the kernel while starting up the lighting-set. It was almost as if night were waiting for him. Blackness fell even as he switched on the lights.

With the darkness came a keen sense of unease. The dome was the trouble. It blazed like a beacon and there was no way of blacking it out except by turning off the lights. Beacons attracted things, and he'd no desire to become a center of attraction in present circumstances. That is to say, not at night.

Long experience had bred fine contempt for alien animals, no matter how whacky, but outlandish intelligences were a different proposition. So filled was he with the strange inward conviction that last night's phenomenon was something that knew its onions that it didn't occur to him to wonder whether a glowing column possessed eyes or anything equivalent to a sense of sight. If it had occurred to him, he'd have derived no comfort from it. His desire to be weighed in the balance in some eerie, extrasensory way was even less than his desire to be gaped at visually in his slumbers.

An unholy mess of thoughts and ideas was still cooking in his mind when he extinguished the lights, bunked down and went to sleep. Nothing disturbed him this time, but when he awoke with the golden dawn his chest was damp with perspiration and Laura again had sought refuge on his arm.

Digging out breakfast, his thoughts began to marshal themselves as he kept his hands busy.

Pouring out a shot of hot coffee, he spoke to Laura.

"I'm durned if I'm going to go scatty trying to maintain a three-watch system single-handed, which is what I'm supposed to do if faced by powers unknown when I'm not able to beat it. Those armchair warriors at headquarters ought to get a taste of situations not precisely specified in the book of rules."

"Burp!" said Laura contemptuously.

"He who fights and runs away lives to fight another day," Steve quoted. "That's the Probe Law. It's a nice, smooth, lovely law — when you can run away. We can't!"

"Burrup!" said Laura with unnecessary emphasis.

"For a woman, your manners are downright disgusting," he told her. "Now I'm not going to spend the brief remainder of my life looking fearfully over my shoulder. The only way to get rid of powers unknown is to convert 'em into powers known and understood. As Uncle Joe told Willie when dragging him to the dentist, the longer we put it off the worse it'll feel."

"Dinna fash y'rsel'," declaimed Laura. "Burp-gollop-bop!"

Giving her a look of extreme distaste, he continued, "So we'll try tossing the bull. Such techniques disconcert bulls sometimes." Standing up, he grabbed Laura, shoved her into her traveling compartment, slid the panel shut. "We're going to blow off forthwith."

Climbing up to the control seat, he stamped on the energizer stud. The tail rockets popped a few times, broke into a subdued roar. Juggling the controls to get the preparatory feel of them, he stepped up the boost until the entire vessel trembled and the rear venturis began to glow cherry-red. Slowly the ship commenced to edge its bulk forward and, as it did so, he fed it the take-off shot. A half-mile blast kicked backward and the probe ship plummeted into the sky.

Pulling it round in a wide and shallow sweep, he thundered over the borderline of vegetation, the fields of crystals and the hills beyond. In a flash he was plunging through the valley, braking rockets blazing from the nose. This was tricky. He had to co-ordinate forward shoot, backward thrust and downward surge, but like most of his kind he took pride in the stunts performable with these neat little vessels. An awe-inspired audience was all he lacked to make the exhibition perfect. The vessel landed fairly and squarely on the milk-white roof of the alien edifice, slid halfway to the cliff, then stopped.

"Boy," he breathed, "am I good!" He remained in his seat, stared around through the dome, and felt that he ought to add, "And too young to die." Occasionally eying the chronometer, he waited awhile. The boat must have handed that roof a thump sufficient to wake the dead. If anyone were in, they'd soon hotfoot out to see who was heaving hundred-ton bottles at their shingles. Nobody emerged. He

gave them half an hour, his hawk-like face strained, alert. Then he gave it up, said, "Ah, well," and got out of the seat.

He freed Laura. She came out with ruffled dignity, like a dowager who's paraded into the wrong room. Females were always curious critters, in his logic, and he ignored her attitude, got his gun, unlocked the doors, jumped down onto the roof. Laura followed reluctantly, came to his shoulder as if thereby conferring a great favor.

Walking past the tail to the edge of the roof, he looked down. The sheerness of the five-hundred feet drop took him aback. Immediately below his feet, the entrance soared four hundred up from the ground and he was standing on the hundred-foot lintel surmounting it. The only way down was to walk to the side of the roof and reach the earthy slope in which the building was embedded, seeking a path down that.

He covered a quarter of a mile of roof to get to the slope, his eyes examining the roof's surface as he went, and failing to find one crack or joint in the uniformly smooth surface. Huge as it was, the erection appeared to have been molded all in one piece—a fact which did nothing to lessen inward misgivings. Whoever did this mighty job weren't Zulus!

From ground level the entrance loomed bigger than ever. If there had been a similar gap the other side of the building, and a clear way through, he could have taken the ship in at one end and out at the other as easily as threading a needle.

Absence of doors didn't seem peculiar; it was difficult to imagine any sort of door huge enough to fill this opening yet sufficiently balanced to enable anyone - or anything—to pull open or shut. With a final, cautious look around which revealed nothing moving in the valley, he stepped boldly through the entrance, blinked his eyes, found interior darkness slowly fading as visual retention lapsed and gave up remembrance of the golden glow outside.

There was a glow inside, a different one, paler, ghastlier, greenish. It exuded from the floor, the walls, the ceiling, and the total area of radiation was enough to light the place clearly, with no shadows. He sniffed as his vision adjusted itself. There was a strong smell of ozone mixed with other, unidentifiable odors.

To his right and left, rising hundreds of feet, stood great tiers of transparent cases. He went to the ones on his right and examined them. They were cubes, about a yard each way, made of something like transpex. Each contained three inches of loam from which sprouted a crystal. No two crystals were alike; some small and branchy, others large and indescribably complicated.

Dumb with thought, he went around to the back of the monster tier, found another ten yards behind it. And another behind that. And another and another. All with

crystals. The number and variety of them made his head whirl. He could study only the two bottom rows of each rack, but row on row stepped themselves far above his head to within short distance of the roof. Their total number was beyond estimation.

It was the same on the left. Crystals by the thousands. Looking more closely at one especially fine example, he noticed that the front plate of its case bore a small, inobtrusive pattern of dots etched upon the outer surface. Investigation revealed that all cases were similarly marked, differing only in the number and arrangement of the dots. Undoubtedly, some sort of cosmic code used for classification purposes.

"The Oron Museum of Natural History," he guessed, in a whisper.

"You're a liar," squawked Laura violently. "I tell you it's a hoodoo—" She stopped, dumfounded, as her own voice roared through the building in deep, organlike tones, "A hoodoo— A hoodoo—"

"Holy smoke, will you keep quiet!" hissed Steve. He tried to keep watch on the exit and the interior simultaneously. But the voice rumbled away in the distance without bringing anyone to dispute their invasion.

Turning, he paced hurriedly past the first blocks of tiers to the next batteries of exhibits. Jelly blobs in this lot. Small ones, no bigger than his wrist watch, numberable in thousands. None appeared to be alive, he noted.

Sections three, four and five took him a mile into the building as nearly as he could estimate. He passed mosses, lichens and shrubs, all dead but wondrously preserved. By this time he was ready to guess at section six—plants. He was wrong. The sixth layout displayed bugs, including moths, butterflies, and strange, unfamiliar objects resembling chitinous humming-birds. There was no sample of *Scarabaeus Anderii,* unless it were several hundred feet up. Or unless there was an empty box ready for it—when its day was done.

Who made the boxes? Had it prepared one for him? One for Laura? He visualized himself, petrified forever, squatting in the seventieth case of the twenty-fifth row of the tenth tier in section something-or-other, his front panel duly tagged with its appropriate dots. It was a lousy picture. It made his forehead wrinkle to think of it.

Looking for he knew not what, he plunged steadily on, advancing deeper and deeper into the heart of the building. Not a soul, not a sound, not a footprint. Only that all-pervading smell and the unvarying glow. He had a feeling that the place was visited frequently but never occupied for any worth-while period of time. Without bothering to stop and look, he passed an enormous case containing a creature faintly resembling a bison-headed rhinoceros, then other, still larger cases holding equally larger exhibits—all carefully dot-marked.

Finally, he rounded a box so tre-

mendous that it sprawled across the full width of the hall. It contained the grand-pappy of all trees and the great-grand-pappy of all serpents. Behind, for a change, reared five hundred feet high racks of metal cupboards, each cupboard with a stud set in its polished door, each ornamented with more groups of mysteriously arranged dots.

Greatly daring, he pressed the stud on the nearest cupboard and its door swung open with a juicy click. The result proved disappointing. The cupboard was filled with stacks of small, glassy sheets each smothered with dots.

"Super filing-system," he grunted, closing the door. "Old Prof Heggarty would give his right arm to be here."

"Heggarty," said Laura, in a faltering voice. "For Pete's sake!"

He looked at her sharply. She was ruffled and fidgety, showing signs of increasing agitation.

"What's the matter, Chicken?"

She peeked at him, returned her anxious gaze the way they had come, side-stepped to and fro on his shoulder. Her neck feathers started to rise. A nervous cluck came from her beak and she cowered close to his jacket.

"Darn!" he muttered. Spinning on one heel, he raced past successive filing blocks, got into the ten yards space between the end block and the wall. His gun was out and he kept watch on the front of the blocks while his free hand tried to soothe Laura. She snuggled up close, rubbing her head into his neck and trying to hide under the angle of his jaw.

"Quiet, Honey," he whispered. "Just you keep quiet and stay with Steve, and we'll be all right."

She kept quiet, though she'd begun to tremble. His heart speeded up in sympathy though he could see nothing, hear nothing to warrant it.

Then, while he watched and waited, and still in absolute silence, the interior brightness waxed, became less green, more golden. And suddenly he knew what it was that was coming. He *knew* what it was!

He sank on one knee to make himself as small and inconspicuous as possible. Now his heart was palpitating wildly and no coldness in his mind could freeze it down to slower, more normal beat. The silence, the awful silence of its approach was the unbearable feature. The crushing thud of a weighty foot or hoof would have been better. Colossi have no right to steal along like ghosts.

And the golden glow built up, drowning out the green radiance from floor to roof, setting the multitude of case-surfaces afire with its brilliance. It grew as strong as the golden sky, and stronger. It became all-pervading, unendurable, leaving no darkness in which to hide, no sanctuary for little things.

It flamed like the rising sun or like something drawn from the heart of a sun, and the glory of its radiance sent the cowering watcher's mind awhirl. He struggled fiercely to control his brain, to discipline it, to bind it to his fading will—and failed.

With drawn face beaded by sweat, Steve caught the merest fragmentary glimpse of the column's edge appearing from between the stacks of the center aisle. He saw a blinding strip of burnished gold in which glittered a pure white star, then a violent effervescence seemed to occur within his brain and he fell forward into a cloud of tiny bubbles.

Down, down he sank through myriad bubbles and swirls and sprays of irridescent froth and foam which shone and changed and shone anew with every conceivable color. And all the time his mind strove frantically to battle upward and drag his soul to the surface.

Deep into the nethermost reaches he went while still the bubbles whirled around in their thousands and their colors were of numberless hues. Then his progress slowed. Gradually the froth and the foam ceased to rotate upward, stopped its circling, began to swirl in the reverse direction and sink. He was rising! He rose for a lifetime, floating weightlessly, in a dreamlike trance.

The last of the bubbles drifted eerily away, leaving him in a brief hiatus of nonexistence—then he found himself sprawled full length on the floor with a dazed Laura clinging to his arm. He blinked his eyes, slowly, several times. They were strained and sore. His heart was still palpitating and his legs felt weak. There was a strange sensation in his stomach as if memory had sickened him with a shock from long, long ago.

He didn't get up from the floor right away; his body was too shaken and his mind too muddled for that. While his wits came back and his composure returned, he lay and noted that all the invading goldness had gone and that again the interior illumination was a dull, shadowless green. Then his eyes found his watch and he sat up, startled. Two hours had flown!

That fact brought him shakily to his feet. Peering around the end of the bank of filing cabinets, he saw that nothing had changed. Instinct told him that the golden visitor had gone and that once more he had this place to himself. Had it become aware of his presence? Had it made him lose consciousness or, if not, why had he lost it? Had it done anything about the ship on the roof?

Picking up his futile gun, he spun it by it's stud guard and looked at it wth contempt. Then he holstered it, helped Laura onto his shoulder where she perched groggily, went around the back of the racks and still deeper into the building.

"I reckon we're O.K., Honey," he told her. "I think we're too small to be noticed. We're like mice. Who bothers to trap mice when he's got bigger and more important things in mind?" He pulled a face, not liking the mouse comparison. It wasn't flattering either to him or his kind. But it was the best he could think of at the moment. "So, like little mice, let's for cheese. I'm not giving up just because a big hunk of something has sneaked past and put a scare into us. We

don't scare off, do we, Sweetness?"

"No," said Laura unenthusiastically. Her voice was still subdued and her eyes perked apprehensively this way and that. "No scare. I won't sail, I tell you. Blow my sternpipes! Laura loves nuts!"

"Don't you call me a nut!"

"Nuts! Stick to farming it gets you more eggs. McGillicuddy, the great—"

"Hey!" he warned.

She shut up abruptly. He put the pace on, refusing to admit that his system felt slightly jittery with nervous strain or that anything had got him bothered. But he knew that he'd no desire to be near that sparkling giant again. Once was enough, more than enough. It wasn't that he feared it, but something else, something he was quite unable to define.

Passing the last bank of cabinets, he found himself facing a machine. It was complicated and bizarre—and it was making a crystalline growth. Near it, another and different machine was manufacturing a small, horned lizard. There could be no doubt at all about the process of fabrication because both objects were half-made and both progressed slightly even as he watched. In a couple of hours' time, perhaps less, they'd be finished, and all they'd need would be . . . would be—

The hairs stiffened on the back of his neck and he commenced to run. Endless machines, all different, all making different things, plants, bugs, birds and fungoids. It was done by electroponics, atom fed to atom like brick after brick to build a house. It wasn't synthesis because that's only assembly, and this was assembly plus growth in response to unknown laws. In each of these machines, he knew, was some key or code or cipher, some weird master-control of unimaginable complexity, determining the patterns each was building and the patterns were infinitely variable.

Here and there a piece of apparatus stood silent, inactive, their tasks complete. Here and there other monstrous layouts were in pieces, either under repair or readied for modification. He stopped by one which had finished its job. It had fashioned a delicately shaded moth which perched motionless like a jeweled statue within its fabrication jar. The creature was perfect as far as he could tell, and all it was waiting for was . . . was—

Beads of moisture popped out on his forehead. All that moth needed was the breath of life!

He forced a multitude of notions to get out of his mind: It was the only way to retain a hold on himself. Divert your attention—take it off this and place it on that! Firmly, he fastened his attention on one tremendous, partly disassembled machine lying nearby. Its guts were exposed, revealing great field coils of dull gray wire. Bits of similar wire lay scattered around on the floor.

Picking up a short piece, he found it surprisingly heavy. He took off

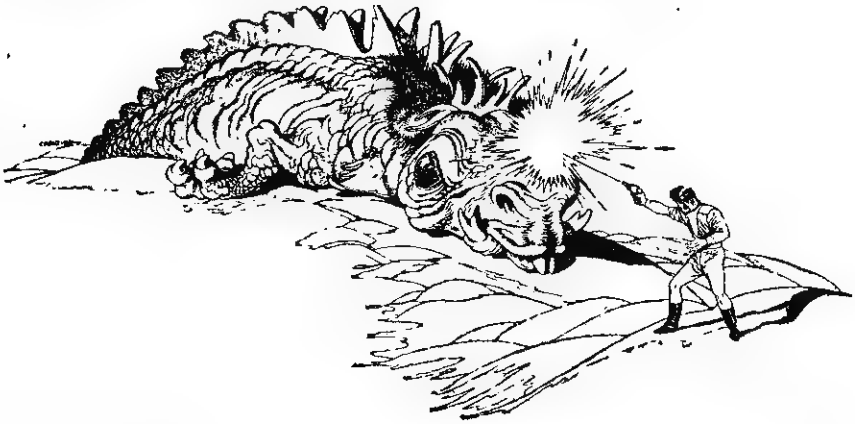
his wrist watch, opened its back, brought the wire near to its works. The Venusian jargoon bearing fluoresced immediately. V-jargoons invariably glowed in the presence of near radiation. This unknown metal was a possible fuel. His heart gave a jump at the mere thought of it.

Should he drag out a huge coil and lug it up to the ship? It was very heavy, and he'd need a considerable length of the stuff—if it was usable as fuel. Supposing the disappearance of the coil caused mousetraps to be set before he returned to search anew?

It pays to stop and think whenever you've got time to stop and think; that was a fundamental of Probe Service philosophy. Pocketing a sample of the wire, he sought around other disassembled machines for more. The search took him still deeper into the building and he fought harder to keep his attention concentrated solely on the task. It wasn't easy. There was that dog, for instance, standing there, statuelike, waiting, waiting. If only it had been anything but indubitably and recognizably an Earth-type dog. It was impossible to avoid seeing it. It would be equally impossible to avoid seeing other, even more familiar forms—if they were there.

He'd gained seven samples of different radioactive wires when he gave up the search. A cockatoo ended his peregrinations. The bird stood steadfastly in its jar, its blue plumage smooth and bright, its crimson crest raised, its bright eye fixed in what was not death but not yet life. Laura shrieked at it hysterically and the immense hall shrieked back at her with long-drawn roars and rumbles that reverberated into dim distances. Laura's reaction was too much; he wanted no cause for similar reaction of his own.

He sped through the building at top pace, passing the filing cabinets and the mighty array of exhibition cases unheedingly. Up the loamy side slopes he climbed almost as rapidly as he'd gone down, and he was breathing heavily by the time he got into the ship.



His first action was to check the ship for evidence of interference. There wasn't any. Next, he checked the instruments. The Electroscope's leaves were collapsed. Charging them, he watched them flip open and flop together again. The counter showed radiation aplenty. The hen clucked energetically. He'd blundered somewhat—he should have checked up when first he landed on the roof. However, no matter. What lay beneath the roof was now known; the instruments would have advised him earlier but not as informatively.

Laura had her feed while he accompanied her with a swift meal. After that, he dug out his samples of wire. No two were the same gauge and one obviously was far too thick to enter the feed holes of the Kingston-Kanes. It took him half an hour to file it down to a suitable diameter. The original piece of dull gray wire took the first test. Feeding it in, he set the controls to minimum warming-up intensity, stepped on the energizer. Nothing happened.

He scowled to himself. Someday they'd have jobs better than the sturdy but finicky Kingston-Kanes, jobs that'd eat anything eatable. Density and radioactivity weren't enough for these motors; the stuff fed to them had to be right.

Going back to the Kingston-Kanes, he pulled out the wire, found its end fused into shapelessness. Definitely a failure. Inserting the second sample, another gray wire not so dull as the first, he returned to the controls, rammed the energizer. The tail rockets promptly blasted with a low, moaning note and the thrust dial showed sixty per cent normal surge.

Some people would have got mad at that point. Steve didn't. His lean, hawklike features quirked, he felt in his pocket for the third sample, tried that. No soap. The fourth likewise was a flop. The fifth produced a peculiar and rhythmic series of blasts which shook the vessel from end to end and caused the thrust-dial needle to waggle between one hundred twenty per cent and zero. He visualized the Probe patrols popping through space like outboard motors while he extracted the stuff and fed the sixth sample. The sixth roared jovously at one hundred seventy per cent. The seventh sample was another flop.

He discarded all but what was left of the sixth wire. The stuff was about twelve gauge and near enough for his purpose. It resembled deep-colored copper but was not as soft as copper nor as heavy. Hard, springy and light, like telephone wire. If there were at least a thousand yards of it below, and if he could manage to drag it up to the ship, and if the golden thing didn't come along and ball up the works, he might be able to blow free. Then he'd get some place civilized—if he could find it. The future was based on an appalling selection of "if:"

The easiest and most obvious way to salvage the needed treasure was to blow a hole in the roof, lower a cable through it, and wind up the

wire with the aid of the ship's tiny winch. Problem: how to blow a hole without suitable explosives. Answer: drill the roof, insert unshelled pistol ammunition say a prayer and pop the stuff off electrically. He tried it, using a hand drill. The bit promptly curled up as if gnawing on a diamond. He drew his gun, bounced a shell off the roof; the missile exploded with a sharp, hard crack and fragments of shell casing whined shrilly into the sky. Where it had struck, the roof bore a blast smudge and a couple of fine scratches.

There was nothing for it but to go down and heave on his shoulders as much loot as he could carry. And do it right away. Darkness would fall before long, and he didn't want to encounter that golden thing in the dark. It was fateful enough in broad light of day, or in the queer, green glow of the building's interior, but to have it stealing softly behind him as he struggled through the nighttime with his plunder was something of which he didn't care to think.

Locking the ship and leaving Laura inside, he returned to the building, made his way past the mile of cases and cabinets to the machine section at back. He stopped to study nothing on his way. He didn't wish to study anything. The wire was the thing, only the wire. Besides, mundane thoughts of mundane wire didn't twist one's mind around until one found it hard to concentrate.

Nevertheless, his mind was afire as he searched. Half of it was prickly with alertness, apprehensive of the golden column's sudden return; the other half burned with excitement at the possibility of release. Outwardly, his manner showed nothing of this; it was calm, assured, methodical.

Within ten minutes he'd found a great coil of the coppery metal, a huge ovoid, intricately wound, lying beside a disassembled machine. He tried to move it, could not shift it an inch. The thing was far too big, too heavy for one to handle. To get it onto the roof he'd have to cut it up and make four trips of it—and some of its inner windings were fused together. So near, so far! Freedom depended upon his ability to move a lump of metal a thousand feet vertically. He muttered some of Laura's words to himself.

Although the wire cutters were ready in his hand, he paused to think, decided to look farther before tackling this job. It was a wise decision which brought its reward, for at a point a mere hundred yards away he came across another, differently shaped coil, wheel-shaped, in good condition, easy to unreel. This again was too heavy to carry, but with a tremendous effort which made his muscles crack he got it up on its rim and proceeded to roll it along like a monster tire.

Several times he had to stop and let the coil lean against the nearest case while he rested a moment. The last such case trembled under the impact of the weighty coil and its shining, spidery occupant stirred in momentary simulation of life. His dislike of the spider shot up

with its motion, he made his rest brief, bowled the coil onward.

Violet streaks again were creeping from the horizon when he rolled his loot out of the mighty exit and reached the bottom of the bank. Here, he stopped, clipped the wire with his cutters, took the free end, climbed the bank with it. The wire uncoiled without hindrance until he reached the ship, where he attached it to the winch, wound the lot in, rewound it on the feed spool.

Night fell in one ominous swoop. His hands were trembling slightly but his hawklike face was firm, phlegmatic as he carefully threaded the wire's end through the automatic injector and into the feed hole of the Kingston-Kanes. That done, he slid open Laura's door, gave her some of the fruit they'd picked off the Oron tree. She accepted it morbidly, her manner still subdued, and not inclined for speech.

"Stay inside, Honey," he soothed. "We're getting out of this and going home."

Shutting her in, he climbed into the control seat, switched on the nose beam, saw it pierce the darkness and light up the facing cliff. Then he stamped on the energizer, warmed the tubes. Their bellow was violent and comforting. At seventy per cent better thrust he'd have to be a lot more careful in all his adjustments; it wouldn't do to melt his own tail off when success was within his grasp. All the same, he felt strangely impatient, as if every minute counted, aye, every second!

But he contained himself, got the venturis heated, gave a discreet puff on his starboard steering flare, watched the cliff glide sidewise past as the ship slewed around on its belly. Another puff, then another, and he had the vessel nose-on to the front edge of the roof. There seemed to be a faint aura in the gloom ahead and he switched off his nose beam to study it better.

It was a faint yellow haze shining over the rim of the opposite slope. His back hairs quivered as he saw it. The haze strengthened, rose higher. His eyes strained into the outer pall as he watched it fascinatedly, and his hands were frozen on the controls. There was dampness on his back. Behind him, in her traveling compartment, Laura was completely silent, not even shuffling uneasily as was her wont. He wondered if she were cowering.

With a mighty effort of will which strained him as never before, he shifted his control a couple of notches, lengthened the tail blast. Trembling in its entire fabric, the ship edged forward. Summoning all he'd got, Steve forced his reluctant hands to administer the take-off boost. With a tearing crash that thundered back from the cliffs, the little vessel leaped skyward on an arc of fire. Peering through the transpex, Steve caught a fragmentary and foreshortened glimpse of the great golden column advancing majestically over the crest, the next instant it had dropped far behind his tail and his bow was arrowing for the stars.

An immense relief flooded

through his soul though he knew not what there had been to fear. But the relief was there and so great was it that he worried not at all about where he was bound or for how long. Somehow, he felt certain that if he swept in a wide, shallow curve he'd pick up a Probe beat-note sooner or later. Once he got a beat-note, from any source at all, it would lead him out of the celestial maze.

Luck remained with him, and his optimistic hunch proved correct, for while still among completely strange constellations he caught the faint throb of Hydra III on his twenty-seventh day of sweep. That throb was his cosmic lighthouse beckoning him home.

He let go a wild shriek of, "Yipee!" thinking that only Laura heard him—but he was heard elsewhere.

Down on Oron, deep in the monster workshop, the golden giant paused blindly as if listening. Then it slid stealthily along the immense aisles, reached the filing system. A compartment opened, two glassy plates came out.

For a moment the plates contacted the Oron's strange, sparkling substance, became etched with an array of tiny dots. They were returned to the compartment, and the door closed. The golden glory with its imprisoned stars then glided quietly back to the machine section.

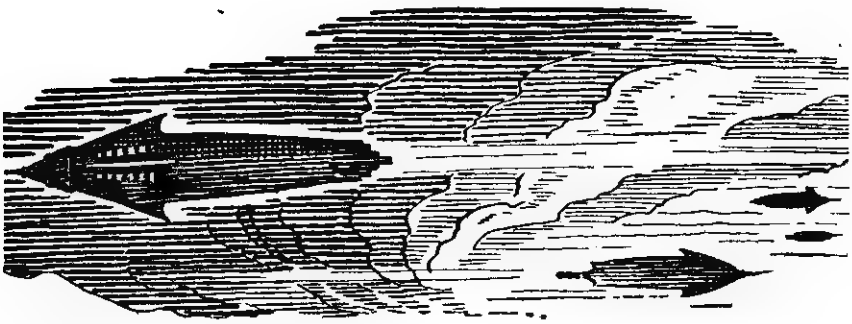
Something nearer to the gods had scribbled its notes. Nothing lower in the scale of life could have translated them or deduced their full purport.

In simplest sense, one plate may have been inscribed, "Biped, erect, pink, homo intelligens type P.739, planted on Sol III, Condensation Arm BDB—moderately successful."

Similarly, the other plate may have recorded, "Flapwing, large, hook-beaked, vari-colored, periquito macao type K.8, planted on Sol III, Condensation Arm BDB—moderately successful."

But already the sparkling hobbyist had forgotten his passing notes. He was breathing his essence upon a jeweled moth.

THE END.



BY P. SCHUYLER MILLER

THE THING ON OUTER SHOAL

***Fantasy**—a strange fantasy of the sea, a realm as mysterious even today as the further deeps of space itself.*

Illustrated by Cartier

The first shock must've come about half past nine. It was in between the parts of that Sunday night concert Martha always listens to, during the talking, and I was up on a chair the way I always am at that time, winding the clock. I felt the chair sort of twist under me, and then the clock jumped off the mantel right into my face, and the two of us came down together with a bang.

I must've laid there stunned for a minute before Martha got to me, and I remember the feeling was like being up on a masthead in a high sea. It was like the whole earth was being sucked out from in under me, and then poured back, slow, like mud running into the hole where your foot has been. She had me by the arm, and I was getting my feet under me again when the second shock hit and both of us went down in a heap.

That was the bad one that smashed things all up and down the coast. We had the least of it, and we were high enough to miss the wave that came after it. It was different from the first one—grating and hard, like a ship driving on the rocks. The

house jarred until the dishes flew off the shelves in the china closet and Martha's pots and pans came clattering down in a mess on the kitchen floor. The cat came flying through the room like it had fits and went scatting up the garret stairs, and then there was one last drop that nearly had my stomach out of me, and it was over.

I've been in quakes before, in Chile, and one time in Japan when I wasn't much more than a shaver, and I had a sort of notion there was more to come. I tried to put up the window, but the twisting the house had had made it stick, so I opened the front door and went out, with Martha right after me.

The fog was in. For two-three days it had been standing off shore and now it was in it was likely to stay. You couldn't see your hand on the end of your arm, but I knew that up on the point the way we are we'd be above anything that was apt to come.

We heard it, and then right away we smelled it—rank full of the rotten muck it had raked up off the bottom of the sea, where things have been dying and settling into the mud for thousands and thousands of years. It sounded like the wind roaring, far away but coming closer, and the smell was enough to make a man gag. I could hear the buoy over Wilbur's Shoal clanging like mad, and I knew from the sound that it was adrift. Then the wave hit shore and I swear the whole point shook. The spray from it showered over us where we stood by the door, and then it struck again, not so hard, and that was the last except for the smell. We had that with us for a time.

We went back inside, because like I told Martha then, if any more was to come it wouldn't matter where we were, and a solid stone house like ours is a pretty safe place to be in come wind or high water. There's not many like it in the entire State of Maine.

I knew the first news would come over the Coast Guard station, so I turned the radio to where they are on the dial and sure enough, they were at it a'ready. It didn't make nice hearing. Aside from the earthquake, which was as bad as we've ever had in these parts, the wave had done a pile of damage all up and down the coast. Down through Massachusetts the big beaches had been swept clean, but it was after the main season and there wasn't many killed compared to what there might have been.

After a little they began to fit things together. The first quake had been pretty well out to sea—maybe twenty-thirty miles—and north of us, but the second one, the big one, was right off Phillipsport and close inshore. I've fished that bottom all my life, and I figured I could place it pretty close. There's a deep place—never sounded to my way of knowing—between Dorner's Bank and Outer Shoal, and the way it sounded that was where it was.

The fog was in and it stayed for three days. Fog don't bother me any, or Martha neither, so we

went down to town next morning but there wasn't any news we hadn't heard on the radio. The Coast Guard plane was waiting for the fog to clear before it went up, and they were getting ready to make new soundings in case the bottom had changed. Up in Alaska there's places where whole mountains have come up out of the sea overnight, and then dropped back again.

The smell was everywhere—rotten fish and rotten seaweed—worse than a keg of lobster bait. We got used to it before the fog lifted. Between 'em the quake and the tidal wave had fetched up the ocean bottom for miles around, and it took a while to settle.

Along Wednesday afternoon you could begin to see a little. The sea off our point was milky, and kind of phosphorescent after sundown. There was all sorts of stuff piled up along the rocks—pieces of sunk ships, buoys, weed, shells, dead fish, lobster pots—every kind of thing. There were lobsters there bigger than any that's been caught in the State of Maine since my grandfather Phillips' time. There was halibut that would weigh up to six-seven hundred pounds, and every kind of fish that was ever in the sea. By Wednesday the smell it made was enough to drive us out, and Martha made me go down with a fork and bury what I could of it.

Wednesday night was clear as a bell, with the moon out full, and I heard the Coast Guard plane up a couple of times. Thursday morning I was up and out with the sun. There wasn't much to see. Clear out to the horizon the sea was chalky with the stuff that had been riled up off the bottom, and there were little black spots of drift that wouldn't likely come in for days. I got out my grandfather Waters' glass and went up on the roof, but it didn't do much good. The buoy was gone off Wilbur's Shoal, like I thought, and so were all the channel markers. I heard in town that one of them fetched up on the veranda of the old Butler place, a good five miles back from the harbor up the inlet.

Out over Outer Shoal there was a kind of white cloud, and I watched it for a long time before I made out it was gulls—millions of 'em—swinging and swooping around over the shoal like they were following a school of mackerel. Then I heard the drone of a plane and picked it up, following the coast up from the south. It had Coast Guard markings, and pretty soon I heard our own plane sputter up off the water and swing over to meet it. They must've seen the gulls like I did, because they turned and circled out over the shoal. They were there a long time, swinging round and round like two big birds, and every now and then one of them would drop down to get a better look, but after a while they started back and I called to Martha and got my hat and went down to town to see what they had found out.

Well, sir, half the village was down to the Coast Guard station when I got there. The pilot from

down the coast turned out to be a Phillipsport boy—Henry Anders' boy Jim— and when he saw me coming he let out a holler.

There was four-five people standing around the planes arguing—all of 'em men I'd been to sea with in my young days—and they were scratching their heads like chickens after corn. Fred Hibbard hailed me first.

"By gaggle," he shouted, "come down here! These boys has a puzzle none of us can answer. Tell him, Jim."

Jim grinned at me. He'd put on flesh since he joined up with the Coast Guard. "Hi there, Cap'n Waters," he said. "Maybe you can tell me more than these old salt horses here. They claim what we saw on Outer Shoal isn't possible."

Tom Buck is our regular pilot here. "You were on the roof when I swung over," he put in. "Likely you saw the gulls over the shoal. We figured maybe a ship had gone aground and broken up, so we went out there, but it's no ship. We don't know what it is."

Old Colonel Phillips may be ninety and he's my own father's uncle, but he's the cussedest old fool in Phillipsport. He creaks like a rusty gate when he talks, and his store teeth don't fit him any better than you'd expect of a mail-order set, but he's never satisfied until he's had his say.

"Blasted young lubbers!" he piped up. "Smart-Alecks! taint no mystery to me, or no need for one! I remember twice in my life there's been a whale grounded on that shoal, and you look in the town records and you'll find plenty more. That wave'd fetch in anything afloat!"

"How do you feel about that?" I asked them.

Jim Anders scratched his head. He has tow hair like his father's folks. They were Swedes, wrecked here and settled, back in my father's time—first-class seamen, every one of them. "Well," he admitted, "I suppose it could be. But if it is, it's the strangest whale I ever saw."

"We couldn't see much," Tom Buck explained. "The gulls have settled on it like flies on a lobster pot, and we couldn't drive 'em off. But it's big big as any whale I ever laid eyes on—and it's funny shaped. And—it's white."

"What'd I tell you?" Colonel Phillips was just about prancing. "It's a white whale. Seen 'em many a time!"

"Belugas don't grow that big, colonel," Buck told him. "And—the shape's wrong."

"Pish! Ever hear about Moby Dick? Ever hear about Killer Ned? There's white whales same as any animal, and most always they're big and mean. How is it now? Pretty ripe, ain't it? Any salvage to it?"

"We couldn't see," Jim told him. "It's no place to set down a plane, with all the drift afloat around the shoal. That quake brought up every derelict this side of the Azores. We've got days of work ahead, locating them. But if you old seahorses can stand the stench, you

might be able to pick up a little tobacco money out there. Whale oil's high."

I could tell then it wasn't only the old men who liked the idea, and I could tell it wasn't going by the board. We may be over sixty, some of us, but there are a few left who have shipped on whalers and know what to do and how to do it. When I went up to the store Henry Anders and Fred Hibbard and Welsh Peters and one or two others were with me, and we found a couple-three more in Clem Potter's back room. Likewise, I saw that the younger men were drifting into Tony Spillani's garage across the street.

It was going to be a race for it, and I could feel my blood getting up at the thought. Likely the young fellers would try to hold off till night and then slip away. We couldn't pull out right in front of 'em, because they'd beat us hull down, but we had to get there first. Then we all of us thought of the colonel.

He knew it, too. He sat back there in Clem's old armchair with a satisfied smirk under his whiskers, waiting for us to ask him. But he couldn't wait long.

"Remembered me, ain't you?" he demanded. "Remembered I got three whaleboats off the old *Minnie P.* in my boathouse this minute, with engines in 'em and all the gear complete. Remembered I got casks and irons and everything you need, over the other side of the point where there can't nobody tell what you're up to. Want 'em, don't you? Well owner's third!"

The old skinflint had us, and it didn't matter much to any of us. It wasn't the oil we were after. It was wondering about the thing that had washed up on Outer Shoal—beating the young bucks at a game they figured we were too old for—having the kind of adventure that we all had thought was over and done with. It disappointed him a little when we took him up so quick. He just snorted and handed over the keys to the boathouse. Then an idea tickled him and he let out a cackle like a guinea hen. He poked Clem in the ribs with his cane.

"I'll fix those young squirts for you!" he vowed. "I know the way they're figgerin'. That man at the old livery stable has him a big new launch, an' that's the boat they'll use. That an' maybe Peters' and Crandall's. You gimme five pounds of sugar . . . no, by Jake, make it ten pounds . . . an' I'll go down sun myself a mite on the wharf while you're gettin' up a blackberryin' party over to my place. An' don't tell the wimmen!"

The old sculpin! There wasn't one of us would have thought of sugaring their gasoline.

The younger men were still in the garage with their heads together when we came out of the store. We split up—the colonel with his sugar sacks in his coat pockets headed for the wharf, and the rest of us scattering to meet along after dinner at the colonel's boathouse. That would give us the afternoon.

He was a shipshape old devil

Those three boats were as good as the day he got 'em, and the engines were tuned up fit to run a clock. Like as not he had some feller from out of town come and do it so's he wouldn't let on he cared how they were. There wasn't a speck of rust on his whaling irons, and his rope was new—brand new, but with the stiffness worked out of it. It was good gear, all of it. My point hid us from town and would until we were a good two miles out. The colonel's sugar would have to take care of things after that

We manned two of the three boats. I was steersman in the first and the colonel took the second. We could reach the whale, mark it, and maybe cut a little blubber before nightfall. It was all any of us wanted—except maybe the colonel the young folks could have the rest with our blessing, after they'd been put in their place.

They'd started up a game of baseball by the time the colonel left town, just to keep our suspicions down, but they must have posted a watch or else someone's wife blabbed. We weren't more than half a mile off the point when we heard the launch start up, and there they came, three boats of them, swinging across to cut us off. I could see the grin on Fred Hibbard's face as he monkeyed with our engine and made it cough and splutter like it wasn't going good. Let 'em be cocky while they could.

They passed us hooting and hollering like wild Indians, and after a time we passed them, lying in the swell, tinkering with their engines. The three boats were strung out over a mile or so of sea, and some of the boys were turning a little green. By that time we could see the shoal.

The smell of the thing and the cackle of the gulls reached us long before we sighted it. It was ripe, but it didn't smell like whale to me It had that seabottom rankness that the quake had brought up, and I began to remember yarns I'd heard about sea serpents and the like of that.

There must have been all the gulls in Maine over that reef. The sea was white with them, bobbing around in the oil slick that had spread from the thing on the shoal. They were stuffed too full to fly, but they covered the thing from the water's edge where it lay awash until it was one big, stinking mountain of white feathers, sixty feet long if it was a yard. From the boats we couldn't tell much about how it looked, but it was—queer.

My boat was first, and we circled around it and came in from the seaward side, down wind. The gulls didn't rise until the boat was almost touching it, and when they did, I looked at the men and they looked at me. Their faces were funny-colored and I guess mine was, too, because it was a man.

The gulls had been at it for better than a day, but you could see it was a man. It was sixty feet from head to feet, more than fifteen feet across the shoulders, and it was a man. There was a layer of thick white blubber on it under a

gray kind of skin. Big blue gills flared out where its neck should have been. And as the boat bumped against it a hand came floating up through the water beside me—wrinkled with the water, and webbed all the way to the tips of the fingers. It was a man.

A cloud had gone over the sun, and the wind was kind of cold on me. The smell of the thing choked me, and the screaming, wheeling birds overhead made my head swim. I reversed the engine and pulled us off a couple of lengths.

The gulls had been at it. All along its barrel of a body they had torn big, jagged holes through its skin and blubber and raw red meat, down to the white ribs. It lay on its face on the shoal, it's back, where there was skin left, dull gray-white like a shark's belly. On its feet it would have looked kind of stubby, I guess, because it looked awful broad for its length, with big, powerful long arms made for swimming, and long, thick legs with webbed feet. Its face was under water, but it had no ears unless the gulls had torn them off, and its head was round and covered with stringy hair like a wad of dirty hemp.

It was a giant man out of deep part of the sea—the part that no man of our kind ever sees or hears tell of, except in sailors' yarns. The earthquake had vomited it up out of the sea to die here on Outer Shoal. The marks of the deep were on it, in the way Nature had made it to stand the pressure down there thousands of fathoms below, and in the great round scars that were on its back and sides. I knew those marks, and so did most of the others with me—we'd seen them often enough on whales. The Kraken had left them—the giant white squid that lives down in the cold and the black of the sea bottom where only whales go—and things like this.

Then I heard the colonel shout. He had climbed up on the dead thing's body and stood there between its gnarled shoulders looking down at us. Another figure bobbed up alongside him—Doc Higbee—and the two of them stooped down to study the thing they were standing on. Then the colonel straightened up as if he'd had a kink in his back and I heard him screech.

We had pulled off into the deep water that goes down like the side of a mountain off Outer Shoal. We had all been watching the two on the thing's back, but now we turned to look.

Out of the water a hundred feet away rose a face. Long hanks of grizzled hair hung over it, and out between them stared two huge, black, goggling eyes. There was a smear of white flesh between them where it should have had a nose. Its mouth stretched halfway across its head right under those staring eyes, and it was filled with little sharp pegs of teeth. The gills began below—a purple frill of flesh, opening and closing as it breathed. As it rose higher its mouth gaped open to suck in air, and I could see that it had no tongue.

It found footing on the shelving edge of the shoal, a boat's length

away, before I had sense enough to move. Then I grabbed for the gas lever and we were hipering out of its way. But it didn't pay us any heed. The water was just under its armpits as it stood there, with its webbed hands floating on the water in front of it. It climbed higher it was the sea-man's mate come after him out of the deeps!

The two men on the carcass were scrambling down the other side into their boat. The colonel made it, but Higbee slipped and splashed into the water. By now the woman-thing was standing knee-deep in the sea beside her mate. I wondered how she could support that monstrous body out of water, but she had giant's muscles. Her great saucer eyes stared at the dead thing, and one webbed hand took it by the shoulder and turned it over.

Then she saw the other boat. It had waited to pick up the doctor, and the men were struggling frantically over the engine with the little colonel hopping and cursing in the bow. She made a lunge toward it and stumbled over the carcass of her mate. The wash as she smashed into the sea nearly overset the boat, but they righted it and suddenly we heard the engine start. It sputtered a moment and stopped.

Henry Anders was harpooner on my father's whaler and he was bow man in my boat now. He got to his feet, picking up the heavy blubber spade at his side, as we came within range of of the thing. It was never meant for throwing, but he hurled that iron like a lance. It struck the sea-woman's shoulder and sliced deep into the thick flesh, so that I could see the purplish blood running. She stopped, shoulder deep, and turned to face us.

Then, close by the colonel's boat and almost within reach of her groping hand the sea went suddenly white and smooth. A great, twisting tentacle went snaking out over the surface of the water and touched its thwart. Like a flash it clamped over the bow, inches from the colonel. A second followed it, and then the monster's body rose slowly out of the waves two evil black pools of ink for eyes—a great white parrot beak—and surrounding them a nest of corps-white tentacles. The Kraken!

It gave off a sickly kind of scent, and the sea-woman smelled it. She seemed to hunch down into the sea. They stared at each other for the space of a minute, and I saw its huge arm uncoiling from around the boat as it watched her. It was wary, but there was no fear in it —or her. Then, like lightning, she pounced; like coiling ropes its tentacles twined round her body,biting deep in the blubber.

Her strength was terrible. Her webbed fingers dug into the Kraken's rubbery flesh; the muscles swelled along her arms and across her naked back, and she tore the monster's body in her hands as if she was tearing rags. But it had its grip; its tentacles sucking and ripping at her leathery skin. One arm was bound fast to her body, and the tip of one tentacle was prying at her heaving gills.

Her legs were spread, her back

bent; the muscles under her coat of blubber stood up in long, low ridges across her back as she set her fingers in the great squid's flesh and tore it loose. Those webbed fingers closed over its staring eyes and gaping beak and squeezed, and the flailing tentacles went limp.

She stood there, thigh-deep in the bloody sea, staring at the dead thing in her hands. She dropped it and her bulbous eyes swung slowly from one boat to the other. Suddenly she lunged forward and the water closed over her head. Then panic struck us.

We may have made ten boat lengths before she reached us. Out of the sea at my elbow the curve of her enormous shoulder rose against the boat. Her groping hand closed over the bow and pulled it under, hurling us over the side into the sea. As I came up, struggling for breath, I could hear the wood splinter in her fist. She dropped it and looked around her for us.

I hadn't heard the plane till then. We were too close for Jim Anders to use his gun, but he zoomed up past her face and she flinched back and batted at him like a kitten at a string. Her head swung around on her shoulders to watch him, and as he dived again she began to flounder away toward the shoal and the body of her dead mate.

That gave him an idea. The rap of his machine gun sounded over the whine of the diving plane—every Coast Guard plane had been armed since that trouble off Nantucket. Gouts of flesh spurted where the bullets struck the dead thing's pulpy form. The sea-woman was swimming frantically away from us. She found her footing again and pulled herself erect, her arms stretched up at the attacking plane. And Jim Anders dived for the third time and shot her down.

There was enough life left in her even then to carry her back into the deep out of which she came. Sometimes it seems that I can see her, swimming painfully down into the blackness and the cold and the quiet, until the last of her life flows out of her and she sinks down into the everlasting darkness where she was born. It was too bad it had to happen like it did.

We came out of it all right. Not even the colonel had more than a week's layup with his blood pressure. Of course we had to take a tongue-lashing from the womenfolks, but we'd figured on that anyway.

The boys in the launches were scared stiff. They'd seen the whole thing, but they couldn't raise a finger to help. The colonel had done a bang-up job on that gasoline.

We don't talk about it much in Phillipsport. Everyone in 'town knows about it, and it's no secret, but we don't like to talk about it much. It wasn't the kind of thing that sets well with a man.

It happened, though—no mistake about that. I have the proof. The pictures Tom Buck made before they bombed the thing to bits and let the sea have it again didn't come out. The gulls were back, and you can't see much but the shape of it.

Far as I know, I have the only other proof there is. I got that from Doc Higbee the winter before he died.

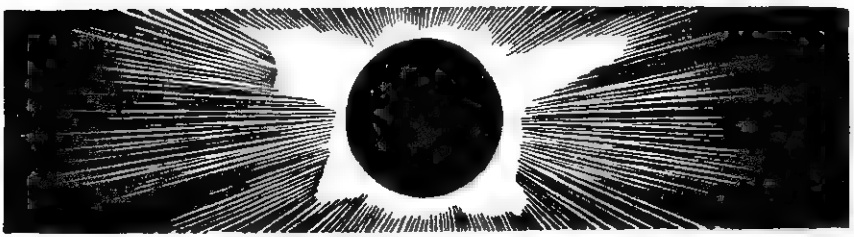
Doc had had time, when he and the colonel landed on the thing, to slice off a chunk of skin and blubber and a mite of the flesh underneath. He kept them by him, even in the water, and stowed them away in alcohol when he got back.

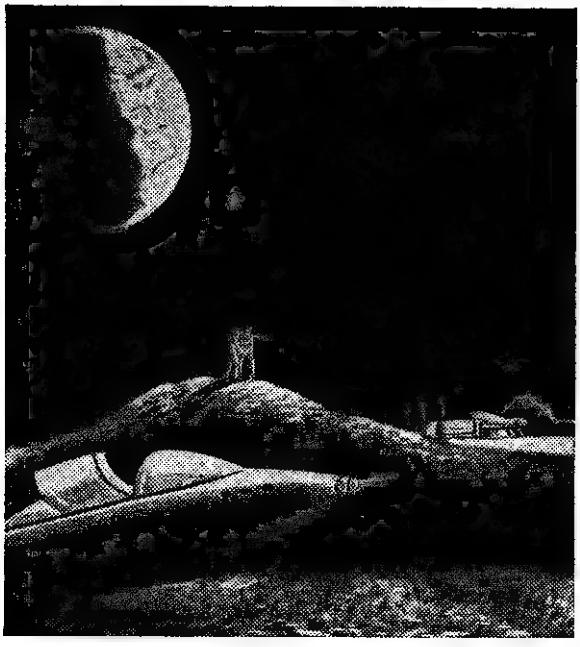
The piece of skin he got shows one of the great round scars that the Kraken left. Maybe they feed on each other, down there miles under the sea where nothing but whales ever get to. Doc said it was human skin. He said the blood in it is human blood, only just about as salty as sea water is today. He showed me a book where it tries to figure out when our first ancestors crawled out of the sea, millions of years back, by measuring the amount of salt in our blood and figuring the amount of salt there was in the sea then. He said they were supposed to match, otherwise things couldn't keep alive.

Suppose some of those things that turned into men stayed in the sea when our ancestors came out on land, Doc said. Suppose they went right on living in the sea, changing the same way the things on land did, growing big enough and strong enough to stand the pressure and the cold down there. They might change into things like the ones we saw, Doc said. There couldn't be many of them, he thought. There wouldn't be enough to eat, except for squids and whales and dead things that sank down from above.

There was a reporter from Boston, a year or two back, got wind of the story some way and tried to pump it out of us. He spent near a week here, I guess, talking to this one and that one. The way he had it, it was a sea serpent that was washed up on the shoal. Well, sir, after a while it got around to the colonel, and I never did hear the like of the yarn he told that man. It was too good. I guess the feller figured it was all lies, which it mostly was, and judged the rumor was the same. Anyway, we've never been bothered about it since — until now.

THE END.





I'LL BUILD YOUR DREAM CASTLE

***If nobody** will give you a job—you can always invent a new line of work. Dream engineering, for instance.*

Illustrated by Timmins

• BY JACK VANCE

When Farrero first met Douane Angker, of Marlais & Angker, Class III Structors, something in his brain twisted, averted itself; and, looking down at the curl on Angker's tough mouth, he knew the feeling went double. Angker, short and solid, had concentrated in him a heavy unctuous vitality, the same way a cigar stump holds the strongest juices.

Farrero did not, on this occasion, meet Leon Marlais, the other half of the firm, nor did he during the entire length of his job. He would not have recognized him face to face on the pedestrip—because Marlais had an odd mania for privacy, secluded himself behind a coded door-press, an unlisted telescreen. When he used his private copter stage, a polarizing field jarred the view to dazzle and shimmer.

Angker held to no such aloofness. The panel to his office stood always

wide. All day the technicians in the adjoining workroom could look in to see him shouldering, driving, battering through his work; watch him barking orders into the telescreen, flourishing a clenched hand for emphasis.

Farrero stayed pretty well away from the office, appearing only for new assignments, avoiding Angker as much as possible. He assumed his work was satisfactory. If not, he felt sure Angker would have fired him, and with gusto. However, the day he knocked at Angker's door to report on the Westgeller job, he knew he was in for trouble.

"Come in!" called Angker, not looking up, and Farrero sauntered forward—tall, lanky, his face, long, droll, wooden, his manner very casual. He had hair the color of wet sand, the mildest of blue eyes.

"Good morning," said Farrero. Angker, after a brief glance upward, grunted. Farrero dropped two strips of microfilm on the desk. "Ready for execution. I've shown them to Westgeller, got his O.K."

"Westgeller? I suppose he can pay for the place." He tipped the strips down the slot in his desk.

"Your credit office likes him," said Farrero. From where he stood, Angker's lowered and foreshortened face looked like a rudely molded mask, with a glazed shapeless nose, thick lumpy lips, eyes hidden under the thrust of his brow. "He makes heavy glass," said Farrero. "The stuff tourist submarines are built from. He's also got a finger in Moon Mining."

The screen on the far wall glowed, ran with blurred colors. Angker, slipping on polarizers, saw a three-dimensional picture—a large solid house backed by a gloomy wall of fir trees. It was an old-fashioned house, warm, Earthy-looking, with high gables and many chimneys, as if it were intended to fight year after year of winter snow. Its colors were a dark red, with gray, white, and green trim, and the sun cells of the roof glowed a rich burnished copper. Behind, the great fir trees marched almost up to the house; and the trunks of many others could be seen dwindling off through the dim aisles. At the front a wide lawn, vivid as argon fire, rolled gently down to a coruscation of bright flower beds. It was clearly a Class III house.

"Ah . . . ah," Angker grunted "Nice piece of work, Farrero. Where's the site?"

"Fifty miles from . . . er. Minusinsk, on the Yenisei." Farrero dropped into a chair, crossed his legs. "Fifty-four degrees latitude, thereabouts."

"Take him hours to get there," commented Angker sourly.

Farrero shrugged. "He says he likes it. Likes the winter -snow - solitude. The untouched forests, wild life, wolves, peasants, things like that. He's got a lifetime lease on three hundred acres."

Angker grunted again, leaned back in his chair. "What's the cost estimate?"

Farrero laid his head back against the support, half-closed his eyes. "Cost us 28,000 munits to build.

Plus ten per cent makes 30,800. I gave it to Westgeller as 31,000."

Angker leveled a sudden under-eyebrow glance at Farrero, squared up in his seat. He pressed a button. A cutaway section of the first floor flicked upon the screen. He pressed again. The second floor. Again. Detailed wall plans. He looked up, and the lines from his nostrils down seemed to gather, purse his mouth, pull it out into a hard lump.

"How do you fix on that figure?" he jerked a pencil toward the screen. "I say that house'll run upwards of 40,000. Ten per cent puts our bid somewhere near 44,000, 45,000."

"I really don't think so," said Farrero politely.

"What is the basis for your estimate?" inquired Angker, as gently.

Farrero clasped his hands around his knee. "Well—look at it from this angle. One of the shortcomings of modern civilization—ancient civilization too, for that matter—is that the average man never gets all he wants of the most desirable products, never makes his life fit his dreams. Very few people can afford space yachts, Venusian fruit, good film libraries, Class III houses. I suppose it could be said that these always unfulfilled ambitions create an incentive to work, to make money, to—"

Angker made a guttural noise. "Less philosophy, Farrero. Leave that for the college professors. I want to know how you're going to build a 40,000 munit house for 20,000 munits."

"Well," said Farrero, "as a matter of fact, I've worked out a construction technique to bring Class III prices closer to Class I and II."

"Ah you have indeed?" Angker was still polite. "Perhaps you'll explain?"

"What's the reason for the differential between Class III and Class II? It's that Class I and II houses are largely prefabbed, and the Class III's are individually built and fitted. We still use carpenters, glaziers, masons, welders, electricians. So, the problem was to find a structural method that would preserve individuality, but cut construction costs. I found the answer. So far as I know it's completely revolutionary."

There was a short pause. Angker sat staring like a mahogany jinni.

"I've tried it on a small scale," Farrero went on, his voice rather more brittle. "It works. For foundations, instead of concrete sills or piers, we fuse the earth under the house with an atomic torch. Then on this glass, flint, slag—whatever you want to call it—we joint up a frame of hyproberyl tubing, stretch Caltonite fabric over it taut. Then we spray on the wall—quick-dry. Also the partitions. The floors come as standard steel sections. The wiring, plumbing, radiants, ventilation, filters are naturally laid out first. Frame, Caltonite fabric, spray, and there's the house, everything but the finish."

"Windows? Doors?"

"Slice 'em out with a torch, set the sills in with a little more quick-dry."

Angker nodded. "Sounds reasonable. Seems like you'd save a lot

of time with the utilities, too." He scratched his chin with the pencil. He leaned abruptly forward. "You shouldn't have given Westgeller the estimate till you checked with the office."

Farrero opened his eyes, raised his eyebrows. "That's my job,"—with the glibness of forethought. "That's what you're paying me for. Designing, estimating, selling."

"This is different. You're not acting for the company's best interests. You've cost us—thirty-one from forty-four -13,000 munits."

Farrero shrugged. "The company's making ten per cent. My instructions were to quote estimated cost plus ten per cent."

When Angker was aroused, his dog-brown eyes glowed with russet lights. Now he put his hands on the edge of the desk, and Farrero, with an inward quiver, gazing deep into Angker's eyes, saw the russet flicker.

"Ten per cent," said Angker thickly, "is a rough basis for operation. However, you're supposed to exercise judgment. This is a money-making concern. We guarantee our customers quality, nothing else. If our price suits 'em, fine. If it doesn't, there's nineteen other outfits with the same kind of license we've got. I could have sold that house for 40,000 and Westgeller would be getting a bargain. You told him 32,000. You're costing us 8,000 munits. I don't like it."

"You forget," said Farrero, getting to his feet, "that what makes this saving is *my* private idea. *I* worked it out."

"On company time."

Farrero flushed. "I built a small scale section with company equipment, for company protection—To check the idea, and see whether it was a lemon or not. The scheme was completely formulated before I even left the Institute. In any event, the patent is in my name."

"Well," said Angker heavily, "you'll have to sign it over to Marlais & Angker."

"*Hah!*" Farrero thrust his hands in his pockets. "You think I'm crazy?"

Angker wrenched off the polarizers. "Farrero, how old are you?"

"Twenty-eight."

"You've put in four years at the Institute, studying Class III technique, right?"

"That's what my license reads."

"So it would be just four years wasted if you couldn't get a job with any Class III outfit?"

Farrero said, "I've got lots of ideas. Maybe I'll start an outfit of my own."

Angker chuckled. "Your license doesn't say that. It gives you authority to plan, to design, to sell. Marlais & Angker hold the license to build. Those licenses are hard to come by nowadays. Without it you can't contract to build an igloo at the North Pole."

"Very true," said Farrero dryly. "So?"

"So—any process developed during your employment with us becomes our property. You get a bonus, of course. There's a hundred legal precedents to back me up."

"If," Farrero interposed tautly,

"I developed the process working for you—which I did not."

"Can you prove it?"

Farrero met the russet lights. "I wouldn't be surprised. I've been talking about it for two years. It's a good idea. It'll bring Class III construction within reach of a lot of Class II incomes."

Angker smiled a glittering hypnotic smile. "Let 'em buy Class II houses—from our affiliate XAB Company. Maybe we'll cut prices in Class II."

Farrero took a half step forward. "What kind of talk is that? Does public welfare mean anything to you, at all? You want to take money without giving anything; you're no better than a pickpocket!"

Angker pushed his knuckles on the desk till they became white buttons. "Get your check from Dempster. You're through, Farrero. You're through in the whole construction game. I'll see . . . I'll make it my business to see that you never work for any other outfit in the world."

"You think you'll turn my idea over to your engineers," jeered Farrero. "Go ahead, let 'em try it. Think I was fool enough to tell you anything important?"

"What more is there?" asked Angker, leaning back in his chair with a half grin.

"Ever try to spray a right angle onto a building? No? Go ahead, try." And Farrero laughed. He stopped. "Sure. Go ahead, try. I've got the patent. I'll throw so many writs and attachments and subpoenas at you, you'll think it's snowing."

"We'll see," said Angker. "Meantime, go out and herd sheep if you want to eat—because I promise you'll never work construction again."

Farrero looked at his fingernails. "Remember what I said about organizing my own outfit?"

Angker pursed his thick lips into a ridiculous smirk. "Have you forgotten the little detail of the license? You haven't got one. You can't get one. There's none being issued. Without a license you can't build a doghouse to sell, anywhere on Earth, Venus, the Moon."

"Sounds pretty definite, doesn't it?" mocked Farrero.

"Go back to Tek, Farrero. Put in another four years on something else. Hydroponics. Protolectrics. Because in construction you're done."

"Angker," said Farrero, "you just listened to one of my ideas. I've got others. Better ones. Before I'm done I'll have cost you so much money, you'll wish you'd taken me in as a partner. Remember that, Angker."

He left the office.

Angker sat staring at the screen, where without polarizers, the image was a chaotic blur. He touched a button. A soft voice said "Yes?"

"Did you hear this last interview?"

"No," said Marlais.

"I'll run it off for you—quite a

lot in it." He pulled open a drawer, twisted a dial, pulled a knob. The magnowire reeled backward to where Farrero had entered the office; then, pulling its impressions past the detector, it echoed for Marlais' ears the entire interview.

"What do you think?" Angker asked the unseen Marlais.

There was a pause, and Angker waited with an anxiety which might have appeared odd to his subordinates.

"Well, Douane," presently came Marlais' soft voice, "you probably could have handled him more smoothly . . . aggression, stubbornness, overt hostility —" his voice trailed off to a whisper. Then: "We'd have a hard time proving ownership of the patent. However, it may be for the best. The industry is stable and comfortable. We're all making money. No telling where the disruption might take us. Perhaps we'd better call a meeting of the association, lay the cards on the table. I think everyone will contract neither to hire Farrero nor use his process."

Angker made a doubtful noise.

"You see," said Marlais, with a gentle edge to his voice, there are twenty companies in the association. The chance of Farrero's approaching any given firm is only one in nineteen. We don't count. Consequently, every operator, to protect himself, will be glad to sign a contract. It might be wise to keep a watch on Farrero, to see what he's up to. He sounded like a young man of determination."

The next day about eleven o'clock Angker called his secretary. "Get me Westgeller."

"Yes, sir . . . there's a call coming in for you right now, Mr. Angker. In fact it's Mr. Westgeller himself."

"Well, put him on."

Laurin Westgeller's face appeared on Angker's screen —fat, friendly, with little twinkling blue eyes. "Mr. Angker," said Westgeller, "I've decided to have you go no further with my job. You can send me a bill for your work to date.

Angker sat glowering at the image. He had been on the point of notifying Westgeller that Marlais & Angker could not build for less than 45,000 munits, had fully expected a cancellation. Westgeller's beating him to the punch left him puzzled, resentful.

"What's the matter? Price too high?" he asked sarcastically.

"No," replied Westgeller, "the price hardly enters into the picture. In fact, I plan to spend 300,000 munits on a house."

Angker's jaw slacked. "300,000 munits? Who . . . I mean, shall I send you out a consultant?"

"No," said Laurin Westgeller. "I've already signed —with one of your late employees, Mr. Farrero, who's going into business for himself."

Angker stared. "Farrero? Why, Farrero has no license to build! The minute he drives a stake into the ground he's liable for a ten thousand munit fine!"

Westgeller nodded. "So he informed me. Thank you, however,

for your advice. Good day." The screen blurred, sank through the pink after-image to blank ground glass.

Angker blurted the news through to Marlais.

"There's nothing we can do until Farrero tries to fulfill the contract," said Marlais. "When and if he makes an illegal move, we file charges."

Angker grunted, shook his head. "He's got something up his sleeve. Farrero's not crazy."

"*Nobody* who gets 300,000 munit contracts is crazy," said the soft voice. "But all we can do is wait, see what his plans are. You've got an investigator on him?

"Yes—Lescovic. He worked for us in that New Zealand deal."

"Yes, I remember. I'll be interested to learn what Farrero has in mind."

Two hours later, Angker's telescreen buzzer sounded.

"Yes?" snarled Angker.

"A Mr. Lescovic, sir."

"Put him on." The face of the investigator appeared—a passive, fat, dark-eyed face, with wide red lips and a button nose.

"Well?"

"Farrero's slipped us."

The spasmodic jerk of Angker's arms shoved him back in the chair. "Where . . . how did this happen?"

"About an hour ago. We dusted his clothes with F-radiant powder, and following him was easy with an F-detector. He walked into the Transport Union, and into a public lavatory. I waited across the lobby, watching the screen. He showed like a big ball of fire. He moved around a little, then was still. When he didn't move after ten minutes, I got suspicious, went to look. His clothes were hung on a hook, but Farrero, no. He gave us the clean slip."

Angker slapped the desk. "Find him, then!"

"There're four operatives on the case right now, sir."

"Call me as soon as you get anything."

Six months later the call came through. The buzzer sounded late in the afternoon. Angker hardly looked up from a model of a Caribbean island. "Yes?"

"Mr. Lescovic calling."

Angker looked up, rubbed his jaw. "Lescovic?"

"The detective, Mr. Angker."

"Oh yes." Angker pulled the case from its mental pigeonhole. "Put him through."

The fat bland face appeared on the screen. "Farrero's back in town."

"When did he get back?"

"Well, evidently during the week."

"Find out where he's been?"

"No word on that."

"What's he doing now?"

"He's calling on Franklin Kerry, of Kerry Armatures. Been there two hours."

"Kerry! Why, Kerry's one of our clients! At least he's looking over our bid for building his house."

Lescovic let a spark of interest show in his careful dark eyes. "He's got plenty of money—registered at the Gloriana."

Angker said. "Hold on a minute." He flipped a switch, reported to Marlais.

Marlais was noncommittal. "We've nothing to go on. We'll have to wait, see what happens."

Angker brought back Lescovic's placid face. "Watch him. Report everything he does. Find out what he wants with Kerry."

"Yes, sir." The screen faded.

Angker slammed into Marlais' office. "Well, he's done it again."

Marlais had been sitting in half-darkness, gazing through the window, out across the many-tiered city, out to the dusk-hung horizon. He slowly turned his head.

"I presume you mean Farrero."

Angker stamped back and forth. "Glochmeinder this time. Last month it was Crane. Before that, Haggarty." He came to an abrupt halt, cursed Farrero with fluid vindictiveness, resumed his pacing. "He doesn't go near any of the small ones, but just let us get wind of a big account—"

"What did Glochmeinder say?"

"Just what Kerry and Crane and Haggarty and Desplains and Churchward and Klenko and Westgeller said. He's given his contract to Farrero, and that's *all* he'll say."

Marlais rose to his feet, rubbed his chin. "There's a leak in the office. Somewhere."

The muscles roped around Angker's mouth. "I've been trying to find it. When I do—" He slowly clenched and unclenched his hand in the air.

Marlais turned back to the window. "No word from the detective?"—from over his shoulder

"I gave you his last report. Farrero's been ordering all over the world—construction materials and landscaping supplies. He's got fifteen hundred men working for him, according to the Department of Labor Statistics, but we can't find where—and there's not a job going anywhere that isn't a legitimate, licensed affair."

"Clever," mused Marlais, toying with the massive blue spinel he used for a paper weight.

"He's cost us a half million munits," gloomed Angker.

Marlais smiled wanly. "Just as he threatened, just so." And he laughed at Angker's quick glare.

For a moment there was silence. Angker paced the floor heavily. Marlais let the smoke from his cigarette trickle up through his finger, lose itself in the half-darkness of the room.

"Well," said Marlais, tamping out the cigarette, "something must be done."

Farrero found himself an office, a two-room suite in the Atlantica Tower, facing west across Amargosa Park, with the Pylon of All Nations thrusting magnificently high in the distance. He also found himself a receptionist, and this was Miss Flora Gustafsson, who claimed Scandinavian ancestry, and had long birch-blond hair, with eyes blue as Folda Fjord, to prove it. She was hardly bigger than a kitten, but everything about her

matched, and she was efficient with the detectives.

The teleview buzzed. Flora reached over, screened the caller. "Oh, good afternoon, Mr. Westgeller,"—for it was indeed Mr. Westgeller's round ruddy features on the screen. "I'll put you through to Mr. Farrero."

"Thank you," said Westgeller. Flora looked sharply at the image, buzzed Farrero.

"Hello, Mr. Westgeller," said Farrero. "What can I do for you?"

"Farrero, an old friend of mine, John Etcheverry, wants to build, and I'm sending him around to see you."

"Oh. . . . ah, fine, Mr. Westgeller. I'll try to accommodate him, though we're pretty busy."

"Good day, Farrero," and Westgeller abruptly left the screen. Farrero sat stroking his chin, smiling faintly. Then he went into the outer room, kissed Flora.

John Etcheverry was about sixty, tall, thin, pale as a heron. He had a large egg-shaped head, sparse white hair that disobeyed his scalp in damp unruly tendrils. His eyes, set in dark concavities, never seemed to blink. His cheeks were wan, minutely etched. He had large ears with long pale lobes, and a long pale nose that twitched when he spoke.

"Have a seat," said Farrero. "I understand you're planning to build."

"That's right. May I smoke?"

"Certainly. Cigar? Try one of mine."

Etcheverry lit up.

"What do you have in mind? I might as well warn you that my prices come high. I deliver, but it costs a lot of money."

Etcheverry made a brief gesture with his fingers. "I want a country place, seclusion, quiet. I'm prepared to pay for it."

Farrero tapped the desk with a pencil once or twice, laid it down, sat back, quietly watched Etcheverry.

Etcheverry puffed on the cigar. "Westgeller tells me you've satisfied him very well. In fact, that's all he'll say."

Farrero nodded. "It's in the contract. I needed time to protect myself. Now I hardly care any more. I'm just waiting for a call from Capitol City, and then, so far as I'm concerned, I'll drop all secrecy." He leaned forward, pointed the pencil at Etcheverry's narrow chest. "You see, I've got enemies. Twenty Class III licensed structors want my blood. Marlais & Angker in particular. I've had to take precautions. Like for instance—" he pressed the stud and Flora's arch face looked out from the screen. "Get me Westgeller at his office."

Etcheverry chewed his cigar reflectively.

A moment passed. The buzzer sounded. Flora's face returned to the screen. "Mr. Westgeller hasn't been in his office today."

Farrero nodded. "It's not important." He turned back to Etcheverry. "Excuse me . . . a habit left over from the early stages of the game. Endless caution, endless foresight. It all helped then. You'd

be surprised the phonies that Marlais & Angker threw at me."

"You have a license?" Etcheverry delicately inspected the tips of his shoes through the cigar smoke.

"No."

"Then you build illegally?"

"No."

Etcheverry pursed his lips. "You'll have to expalin."

Farrero stared thoughtfully out the window. "Um . . . how much time can you spare?"

"You mean —?"

"Right now."

"Well . . . there are no important demands on my time."

"If you can give me the rest of the day, I'll do better than explain— I'll demonstrate."

"Fine." Etcheverry put out his cigar. "I'll admit you've aroused my curiosity."

Farrero called an air cab. "Purdy Field," he told the driver.

At Purdy Field, Farrero took Etcheverry into the hangar. "Jump in," and he followed the stooped figure into the two-place space boat.

Etcheverry adjusted himself gingerly to the cushions. "If you haven't a license to build, I hope at least you have a license to fly space."

Farrero grinned. "I have. Check it if you care to. It's under the aerator."

"I'll take your word for it."

They rode up off the seared field on snoring atomic jets, beat up, up, up. A hundred miles, two hundred and earth blurred below. A thousand, five thousand, ten thousand miles — twenty, thirty thousand miles, and Farrero kept a close watch on his radar screen. "Should be about here now—" A pip showed yellow-green. "There it is." He swerved the boat, jetted off in the new direction. After a minute:

"You can see it below, off to the left."

Etcheverry, craning his gaunt neck, saw a small irregular asteroid, perhaps a mile in diameter. Farrero edged down the boat, lowered with hardly a jolt on a patch of white sand.

Etcheverry grabbed Farrero's arm violently. "Are you crazy?" he squealed. "Don't open that port! That's space out there! Vacuum!"

Farrero shook his head. "There's air. Fifteen pounds pressure, twenty per cent oxygen. Good breathing. I'm not crazy. Look at the barometer."

Etcheverry looked, watched numbly as Farrero flung open the port. The air was good.

Farrero jumped out of the boat. Etcheverry followed. "But . . . there's gravity here—"

Farrero climbed to the top of a little hillock, waved an arm to Etcheverry. "Come on up."

Etcheverry stalked slowly up the slope.

"This is Westgeller's estate," said Farrero. "His private world. He paid 300,000 munits for it. Look, there's his house."

Westgeller's house sat on a wide flat field covered with emerald-green turf. Nearby a lake glistened in the warm sunlight, and a white crane stood fishing among the rushes. Trees lined the plain, and Etcheverry heard birds singing across the distance.

The house was a long rambling structure, single-story, built of redwood planking. There were many windows, and below each, a window box overflowing with floral color. Beach umbrellas, green, orange, blue, rose like other, larger flowers from a terrace.

Farrero squinted across the field, smooth and grassy-green as a golf course. "Westgeller is at home. I see his space boat. Like to call on him? Might like to talk things over with your old friend, eh, Mr. Etcheverry?"

Etcheverry gave him a sharp side glance, said slowly: "Perhaps it would be just as well if—"

Farrero laughed. "Save it. It's no good. You probably don't know I read lips. Well, I do. I was stone deaf the first ten years of my life. And when you flashed Westgeller's picture on my screen, his voice saying, 'I'm sending over my dear old friend Etcheverry,' and his lips saying, 'I've decided to have you stop work on my job, Mr. Angker,' I smelled a rat. I suppose you're Marlais. It's a cinch you're not Angker."

The thin man shrugged, gave Farrero a quick side-glance. "I'm Marlais. Nice set-up you've got."

"I like it," said Farrero. "I'm making money."

Marlais looked around the toy world. "You're spending it too." He stamped his long fragile-looking foot on the ground. "You've got me beat. How do you lick gravity? Why doesn't the air all blow away? Seems as if I'm . . . oh, about normal weight."

"You're a little lighter," said Farrero. "Gravity here is three per cent less than on Earth."

"But," and Marlais looked hori-

zon to close horizon, calculated, "call this a half mile in diameter—that'll be a half of a half cubed, approximately—one sixteenth cubic mile. Earth is . . . 512 trillion over two is 256 trillion cubic miles. And the gravity is the same. Why?"

"For one thing," said Farrero, "you're closer to the center of gravity—by almost four thousand miles."

Marlais reached down, plucked a blade of grass, inspected it curiously.

"All new," said Farrero. "The trees brought here at no slight effort, I'll tell you. Lindvist he's a Danish ecologist -is working with me. He figures out how many bees I need to fertilize the flowers, how many earthworms, how many trees to oxygenate the air."

Marlais nodded his head, darted Farrero a look from shadowed eyes. "Very good, very good!"

"There won't be a millionaire living on Earth in another twenty years," mused Farrero. "I'll have sold them all private planets. Some will want big places. I can furnish them—"

"Incidentally, where did you get this one?"

"Out in space a ways."

Marlais nodded sagely. "That's probably where Marlais & Angker will go to find theirs."

Farrero turned his head slowly, looked the man up and down. Marlais met his glaze blandly.

"So—you think you'll cut in?"

"I'd be a fool if I didn't."

"You think," Farrero went on meditatively, "that you'll cash in on my idea. You've got all the equipment, all the technicians necessary for a quick skim at the cream. Maybe you'll even get some laws enacted, barring non-licensees from the game."

"If I didn't—I'd be a fool."

Farrero shrugged. "Well . . . maybe yes. Maybe no. Like to see another of my jobs? This is Westgeller's. I'll show you Desplains'."

Marlais bowed his head. They re-entered the space boat. Farrero clamped the port, pulsed power through the jets. Westgeller's world fell away beneath them.

They reached Desplains' world half an hour later. "Eventually," said Farrero, "space around Earth will be peppered thick with these little estates. There'll be laws regulating their orbits, minimum distances set for their spacing—" He jerked the controls, threw the power-arm hard over. The space boat fled across Desplains' sky.

Marlais squirmed his long bony shoulder blades, cleared his throat with a sound like a saw cutting a nail, glanced sidewise at Farrero. "Why did you do that?"

Farrero expelled a lung full of taut air. "That was a narrow one. Did you see it slip past?"

"No."

"I forgot that Desplains wanted a moon. It's been installed. We just about rammed it."

He set the boat down on a rocky outcrop. Marlais unsealed the port, angled his skinny legs to the ground. *"Phew,"* he grunted, "Desplains must intend to raise orchids—positively dank."

Farrero grinned, loosened his jacket. "He hasn't moved in yet. We're having a little trouble with the atmosphere. He wants clouds, and we're experimenting with the humidity." He looked up. "It's easy to get a muggy high overcast—but Desplains wants big fluffs of cumulus. Well, we'll try. Personally I don't think there's enough total volume of air."

Marlais looked into the sky too, where Earth hung as a huge bright crescent. He licked his pale old lips.

Farrero laughed. "Makes a man feel naked, doesn't it?" He looked across the little world to the queerly close horizon—barely a stone's-throw off, so it seemed—then back to the sweep of sky, with the majestic crescent of Earth dominating a new Moon behind. "Out here," he said, half to himself, "beauty comes a lot at a time."

Marlais gingerly perched himself on a slab of rock. "Exotic place."

"Desplains is an exotic man," said Farrero. "But he's got the money, and I don't care if he wants the rocks upholstered with rabbit fur." He hopped up beside Marlais. "Desplains wanted something unusual. He's getting it." He indicated a clump of trees. "That's his bayou. Flora from Africa and the Matto Grosso. Fauna from here and there, including a very rare Tasmanian ibis. It's rather pretty, and certainly wild enough—connecting ponds, with overhanging trees. The moss hasn't got a good start yet, and there isn't quite the authentic smell, but give it time. Behind there's a . . . well, call it a swamp—a jungle cut with a lot of waterways. When the flowers all starting blooming it'll be heaven—"

"Individual worlds to suit any conceivable whim," murmured Marlais.

"That's it exactly," said Farrero. "We've got our largest world—about ten miles diameter—sold to a Canadian yachtsman."

"Fred Ableman," said Marlais dryly. "He canceled his contract with us about two months ago."

Farrero nodded. "He wants his world all ocean—blue ocean, plenty of wind to sail his boats. He wants islands here and there, with beaches and coral banks—"

"Coconut palms too, I expect."

"Right—but no sharks. We won't have it completed for another year and a half. It's heavy and unwieldy—difficult to bring out and get established in an orbit. Then there's an awful lot of water needed."

"Where do you get the water? You can't bring it out from Earth?"

Farrero shook his head. "We mine the Hipparchus ice floe, and every time the moon comes in apposition we shoot across a few big chunks. Slow but sure. It costs a lot, but Ableman makes too much money for his own good. Anyway, how could he spend his money better?"

Marlais pursed his lips in agreement. "I expect you get some strange specifications."

Farrero grinned. "There's a man named Klenko, made his money in fashion design. He's the man re-

sponsible for those whirling things women were wearing a year or two ago on their heads. Strange man, strange world. The air is full of thirty-foot glass bubbles, floating loose. Glass bubbles everywhere—topaz, blue, red, violet, green—high and low. It's a hazard trying to land a space boat. He's got a fluorescent forest—activizers in the sap. When he turns ultraviolet on it, the leaves glow ghostly pale colors—silver, pale-green, orange. We built him a big pavilion overhanging a lake. Luminous fish in the lake."

"He evidently plans a lot of night life."

Farrero nodded. "He wants nothing but night. His world won't have any axial spin at all, when we get it trued in its orbit. But he'd better watch his step, or he'll get in trouble with the Anti-Vice League if he goes through with some of his entertainment ideas."

Marlais shrugged, took a cigarette from an onyx case, lit it. "If a man owns his world, I suppose he makes the laws."

"That at least is Klenko's theory."

Marlais blew out a puff of smoke. "One thing has me stumped," and his shadowed eyes calculated Farrero. "How do you beat gravity? So far as I know, artificial gravity has never been discovered."

Farrero nodded. "True."

Marlais made an airy gesture. "Well—whatever the system is, I imagine it will work for Marlais & Angker, too."

"So it would," said Farrero. "Only Marlais & Angker have come to the party late. I don't especially want to drive them into bankruptcy. I don't imagine I could. There'll always be Class III construction on Earth. But Farrero is pulling all the nuggets out of the pan, and he's making an awful dent in that precious twenty."

Marlais shook his head, and a spark appeared back in the depths of his eyes. "You have not quite grasped the idea, my friend. We don't plan to take the back seat. We have the connections, the equipment, the staff. We can bring the asteroids out here cheaper than you can, undersell you four ways from Sunday. We'll even take losses if we need to. But you won't stay in business long. Whatever, however you handle gravity, our engineers can duplicate the conditions."

"My dear Mr. Marlais," jeered Farrero, "do you think I'm a fool? Do you think I'd leave a loophole for you and the other bandits? Have you ever heard of the Norton Space Claims Act?"

"Certainly. It defines and authorizes mining development of the asteroids."

"That's right. I've filed on eleven hundred and twenty two asteroids. Of a peculiar nature— You see that little black pebble by your right foot. That shiny one, like flint. Pick it up."

Marlais reached, g r a s p e d, strained. His mouth slacked in amazement. He pulled again, till his skinny old arms quivered, creaked. He glanced up at Farrero.

"It weighs close to a ton, I expect," said Farrero. "It's star stuff. Matter crystallized at tremendous pressure in the heart of a star. It figures out about a ton a cubic inch. A little bit turns on a lot of gravity. Somehow or other, eleven hundred and twenty-two good-sized chunks of the stuff drifted into an orbit around the sun—not too far out from Earth. They're small and dark and not heavy enough to cause any noticeable perturbations. But when you stand on their surface, the center of gravity is close enough to give you fairly close to Earth weight. I've filed on every one of those chunks, Marlais. Some I'll have to lump together, others I'll have to crust over with a few miles of ordinary matter to reduce gravity. It diminishes, you know, as the square of the distance from the center of mass— But I tell you what, Marlais," Farrero opened the port of his space boat, motioned Marlais in, "I know where you can get all this heavy matter you can use."

Marlais wordlessly climbed into the boat. He eyed Farrero lambently. "Where?"

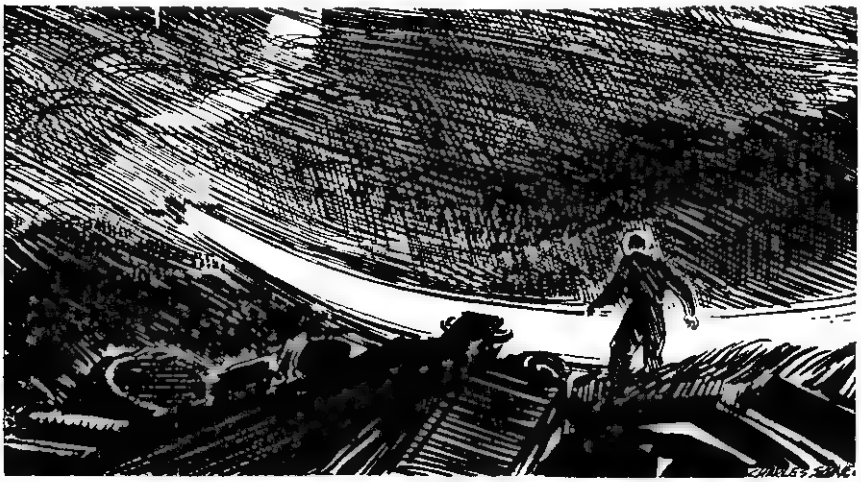
Farrero clamped the port, swung the power-arm, and Desplains' world fell off below.

"Here's what you do," Farrero confided. "You go out to Sirius, only ten light-years. It's got a small companion. You can cut chunks off the companion, as big as you want, as many as you want. Bring them back to Earth, and then you'll be in a position to compete with Farrero-Styled Worlds."

Marlais stared ahead at expanding Earth, knees hunched up under his sharp chin. Farrero could not resist a last gibe.

"Of course there'll be the detail of cooling off your acquisitions. I understand they're pretty h o t. Twenty or thirty million degrees Centigrade—"

THE END.



Concerning the Missile Family, its ramifications — and why rocket weapons behave — or misbehave — as they do.

PUSH FOR PUSHBUTTON WARFARE

BY WILLY LEY

Most observers of military matters, in uniform and out, seem to be united in the conviction that the position of the gun as the one and only reliable military long-range weapon is seriously threatened. The indications that this is the case certainly are easily visible—bombardment rockets are crowding the field guns, long-range rockets have far surpassed any guns and are even crowding the bombing plane, and missiles, of all kinds and types, are crowding everything else. If it were possible to poll the weapon experts, it is quite likely that a majority of them would be moved to prophesy that the gun is going to be fully and completely replaced by the missile within two decades at most, probably less.

Of course there is a difference between listening to such statements and analyzing them. Prophecy is a hazardous business and one can never be too sure about such things, technological developments have taken queer and unsuspected turns in the past and will do so again.

There have been threats to the position of the gun before and especially on two occasions these threats looked serious, at least to some contemporaries. But in both cases the outcome was that the threats vanished, not the guns. It is interesting that these threats were, in one case, rockets, and in the other missiles. The rocket threat is now known to military historians as the Congreve Period which lasted from about 1804 to about 1850. During that time Congreve bombardment rockets outranged and "outecono-

mized" the contemporary guns. But then the guns acquired rifling and later recoil absorbers and cartridges —and the crude blackpowder rockets of Congreve and his successors vanished.

The other threat concerned not guns in general but only their most impressive variety, coast defense and naval rifles. When, after a long period of elementary mistakes and of trial and error the naval torpedo emerged as an effective weapon, it was prophesied that torpedo tubes would take the place of harbor batteries and that the floating counterpart of the coast defense battery, the turret guns, would likewise be replaced. But everybody knows that even during World War II—not counting submarine warfare—the big naval rifles, with radar's assistance, caused more damage than torpedoes.

In the light of these past events one might be inclined to feel that today's discussions are rather futile and that any attempt at prediction is useless. But, in spite of the oft-quoted saying, history does not repeat itself. It may seem to do so, superficially, but there is no actual repetition, merely a recurrence of similar patterns. And when a fundamental factor changes, and entirely new set of conditions is created automatically.

There are even two fundamentally new factors now, both acting in the same direction. Up to a few years ago the accuracy of a weapon was the prime criterion in judging its effectiveness. If accuracy was lacking, either inherently or through circumstances, volume of fire could often serve as a substitute, producing, of course, the difficulties of volume supply.

But the two new factors, the proximity fuse and the atomic bomb, abolish the requirement of accuracy without the need for multiplied volume. The proximity fuse converts any reasonable near miss into a hit and the inexpressible violence of an atomic explosion works in the same direction. Even ten tons of TNT are wasted in a half mile miss—but the ten or so pounds of plutonium which constitute "critical mass" are as destructive and deadly half a mile away as they are directly overhead.

This fact changes history in general and the theory of weapon design is merely a small part of history which is changed along with the rest. The potential future of the missile is caused not by its own existence, but by the existence of the fission bomb.

Before we go on it is necessary, however, to clarify the meaning of the terms which are going to be used. The dictionary defines the word "missile" as "a weapon or thing thrown, or designed to be thrown, to injure another." Strictly speaking the term missile embraces the whole list, coconuts and boomerangs, arrows and crossbow darts, pistol and rifle bullets, mortar projectiles and sixteen inch shells, hand grenades and airplane bombs, bazooka rockets and V-2s. But in military parlance missile has come to mean something else, although

it is not easy to state in a few words just what it does mean.

Somewhere in classical literature —I forget just where—there are two lines reading: "Canst thou stop the floods of the river? Or canst thou call back the arrow shot from the bow?" Well, a missile, in contemporary military English, is the arrow that can be called back after it has been shot, or that can at least be deflected to hit another target than the one against which it was first discharged. Hence the word missile, as now used, does not include projectiles fired from a gun or simple solid fuel rockets fired from a launching tube.

Even with this restriction the "family tree" of missiles is a growth bearing diversified fruit. There is one branch which is that of the gravity-powered missiles, otherwise known as airplane bombs. The majority of them are as much beyond the influence of the bombardier when released as artillery shells are beyond the influence of the gunnery officer after the lanyard has been pulled. But some are guided, by means of movable tail fins—as in the *Azon* bomb—or a movable shroud wing—as in the *Roc*—the fall of the bomb can be deflected so that it may hit a target which an ordinary bomb of the same size, weight and shape would miss.

All the other branches of the missile family have it in common that they are both powered in one way or another and guided in some manner, even if the guiding is something as simple as a robot pilot capable only of keeping them on a straight course. While missiles may be classified according to the system of guiding used, the picture becomes much clearer if classification is made according to power plants. For, after all, it is the power plant which determines the essentials of performance, not the method of guiding.

Going by power plants we get two large groups, the engine-powered missiles and the rocket-powered missiles. In order to start with the less interesting kind so as to progress to the more interesting varieties we'll begin with the engine-powered missiles.

Among them there is one branch which is isolated and comparatively old. It is the naval torpedo, engine-powered like its more recent winged relatives, but designed for a specific element—for water. All others have the air as their element and most of them rely on the air as a carrying medium, they are aerodynamically supported when on their mission.

Just as the naval torpedo can best be defined by stating that it is an unmanned model submarine, the aerodynamically supported engine-propelled missiles are pilotless model airplanes. The word "model" has been inserted to indicate that they are usually too small to be man-carrying, but that is not a hard and fast rule. The first of the missiles which saw extensive operational use, the German V-1 flying bomb, was large enough to be man-carrying. Indeed, there existed a piloted "suicide version" of the V-1 which

was not used because of the lack of volunteers.

That the V-1 used the so-called impulse duct or reso jet was merely a result of cheapness of manufacture and ease of mass production of this particular kind of jet engine. Theoretically a missile of the engine-powered aerodynamically supported group can use any kind of engine, reso jet, turbo jet, athodyd—ram jet or Lorin Duct—and even an ordinary aircraft engine with propeller. Those that are simplest in design, reso jet and athodyd, happen to have the disadvantage of being incapable of functioning when at rest, they need a launching device or a rocket booster for take-off.

The tactical uses of the engine-powered missiles are obvious. They can serve as a substitute for long-range artillery—like V-1—they can serve as Air-to-Ship and Air-to-Ground weapons, or even, if athodyd-powered and provided with rocket booster, as Ground-to-Air weapons. They all share the drawbacks of not being able to travel at very high altitudes—hardly more than 50,000 feet—and they are all vulnerable to interception, both by interceptor planes and by antiaircraft fire. There can be little doubt that a manned interceptor plane will always be superior in performance to any interceptible missile of that kind; the engine in a piloted plane which is expected to return to its base after performing its mission can and always will be more highly refined—and more expensive—than the engine installed in a missile which can be used only once.

It is interesting that much of the interception from the ground will always be done by antiaircraft guns. The limit is at about two miles from the ground. Even a high-acceleration antiaircraft missile will not climb to a two-mile altitude faster than an ordinary antiaircraft shell. Expressed in terms of the time involved, the limit is in the neighborhood of ten seconds, which corresponds to about two miles. If the missile to be intercepted is higher than two miles, or farther away than ten seconds of shell flight, antiaircraft missiles have an inherent superiority. Below those limits the superiority is with the guns.

This brings us to the group of antiaircraft missiles which at the present moment is almost synonymous with missiles which, like the preceding group, are aerodynamically supported but rocket powered. All known examples happen to be German. They were Junker's *Schmetterling* — Butterfly — which had been designated as V-3 by the Nazi Ministry of Propaganda, Rheinmetall's *Rheintochter*—Rhine-maiden—and the antiaircraft rocket *Wasserfall*—Waterfall. *Schmetterling* looked like a small airplane, the fuselage was filled with electronic equipment and a small generator, driven by an impeller sticking out in front. It had two rocket units, above and below the fuselage, which were jettisoned when exhausted. *Rheintochter* was a six-winged rocket with the rocket jets emerging slantwise from the spaces between the wings, with four stabilizing fins around the

nose, with a "warhead" carried in the tail section and a four-winged booster rocket. *Wasserfall* was a small edition of a V-2 rocket, powered not by liquid oxygen and alcohol like V 2, but by nitric acid and *Visol* al -vinyl ethyl ether—and equipped with the proximity fuse *Kugelblitz*—ball lightning. All these antiaircraft missiles were guided from the ground. All came too late to take any active part in the war, but they represent prototypes of ground-to-air weapons to come.*

A-4b has to be added to the group of rocket powered and aerodynamically supported missiles. Like its half-size offspring *Wasserfall* it had four stubby swept-back wings in addition to its four large stabilizing fins. But in the case of A-4b the purpose was somewhat different, like the original A-4 or V-2, the A 4b was to be used as long-range artillery, the wings were to add a hundred mile glide to the ordinary 200 mile range of the A-4.

Of course the inaccuracy resulting from such a glide path is apt to be so great that even an atomic warhead could not make up for it. Guiding by radar from the place of firing also will not work at such ranges any more, radar operates along a line of sight much like optical seeing, and at 300 miles the rocket would be below the horizon and out of reach for radar. Besides the rocket is not as ultra fast along the glide path as a true long-distance rocket, hence the virtually noninterceptible long-distance rocket becomes interceptible during the last sixty or seventy miles, hardly an improvement.

The last group of missiles, the group which is the most interesting from the scientific point of view and also of greatest potential value for peaceful as well as for military purposes is the group of rocket-propelled and aerodynamically unsupported missiles. Hence these missiles are not limited in altitude either by their power plant or by winglike attachments which rarely help much in any case but which always successfully impede a rocket's performance. Theoretically the aerodynamically unsupported rockets can attain any size, any altitude, any range and any speed. And they are virtually noninterceptible. Interception by similar missiles is not quite impossible but will take some doing—but even those who believe that they might be interceptible admit that there cannot be a hundred per cent interception—and the atomic warhead of the one which was not intercepted naturally accounts for a city.

The last group, at the instant of writing, comprises just two known types, the German A-4—V-2—rocket and the American *GAPA*—Ground-to-Air-Pilotless-Aircraft—designed as a prototype of missiles meant to intercept A-4 missiles.

We'll try to see now what such long-range missiles can do and in order to have a comparison of some kind, hypothetical long-range guns will be used for this purpose step by step. There is, of course, an upper

* This is not a complete list of German rocket weapons which were under development. Those mentioned are representative examples, but there existed other types, like *Enzian* - Gentian—; *Grosser Enzian* Big E—; *Fritz* (X 4) and others.

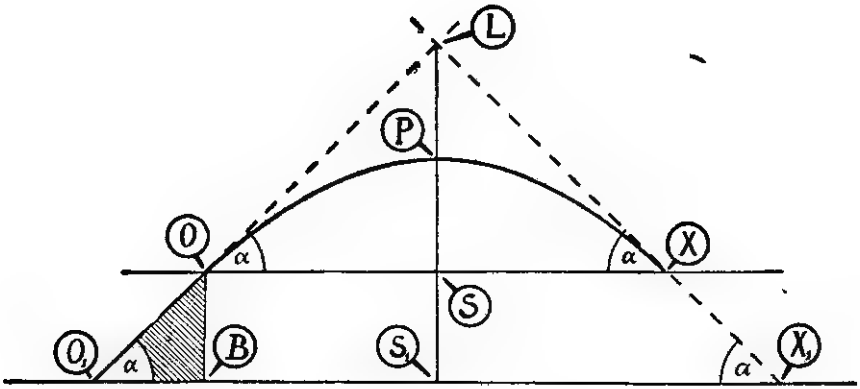


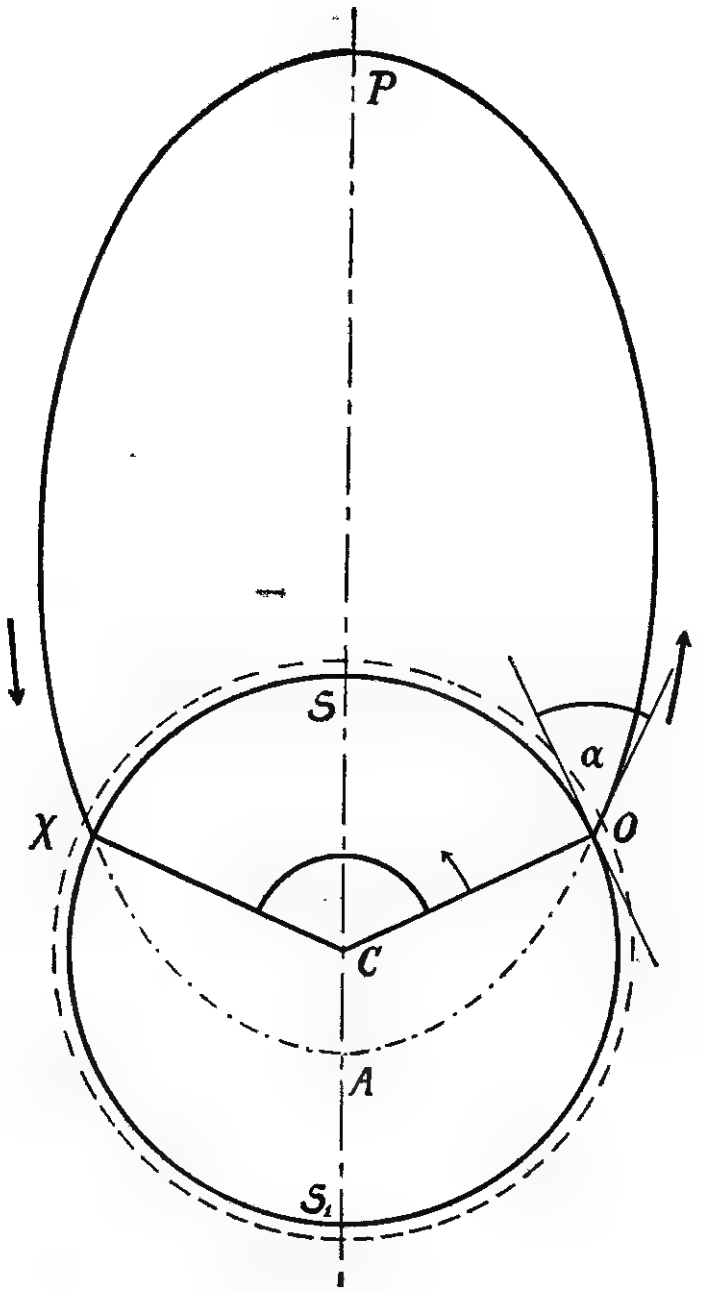
Diagram I: Simplified analysis of the trajectory of a shell fired at a 45° angle upward.

limit for the performance of long-range guns and this limit seems to have been approached rather closely. But there is no upper limit to the size of long-range rocket, even though the larger sizes could not be built at the present moment.

The problem of rocket ranges, like that of gun ranges, is one of the problems of the science of external ballistics. It is called external, because it shows not the slightest bit of interest to the things that happen to a projectile inside the gun barrel, or, in the case of the rocket, to what happens inside the rocket motor. External ballistics begins at the gun muzzle. And the only things which the expert in this field wants to know about the gun are the velocity with which the shell leaves the muzzle and the direction of the axis of the gun barrel. What he really means by that is the angle formed by the axis of the barrel with a line from the gun barrel's breech to the center of the Earth. This angle, minus 90° is what is called the elevation of the gun. Only when details have to be investigated is he also interested in the "real elevation" of the gun, its height above sea level. Again this is not what he really wants to know, he is out for the air density at the muzzle.

In some ways the science of external ballistics is rather simple, in others it is easily the most complicated and most difficult science in

Diagram II: One possible orbit for a 7000 mile trajectory of a rocket. It goes more than 7000 miles up to make the ground distance.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nature or rather in man's mutual relationships. Not only for simplicity's sake but because a magazine has only so many pages I'll try to stay on the simple side. And I'll state at the outset without wasting time and space for proof, that a gun has theoretically maximum range when the elevation is 45°.

Forgetting about a few factors at first—but I do like to mention what those neglected factors are. They are:

(1) air resistance,
(2) the fact that the surface of the Earth is not a plane but a sphere or something very close to a sphere,
(3) the fact of the Earth's diurnal rotation,
(4) the fact that the line to the center of the Earth at the point of firing is not parallel to the line to the center of the Earth at the point of impact, and finally
(5) the fact that the gravitational attraction of the Earth diminishes with height.

The factors 2, 3, 4 and 5 do not begin to show to any large extent until the range is at least 40 miles while factor (1) shows always in the most disturbing manner. That factor, air resistance, is strangely enough least disturbing at the two extremes. It hardly shows for heavy projectiles over very short ranges, say up to 1500 yards, and for very heavy projectiles over very long ranges, say above 300 miles. In the former case air resistance does not have much influence because the projectile moves rather slowly, in the latter case it does not show too much because a very large section of the trajectory is, of necessity, located in layers of the atmosphere which are tenuous, to put it mildly.

Forgetting at first about these five factors—I am starting that sentence over again—the relationships are simple. If a gun fires straight up, its projectile will reach a certain height, which we'll call s. Fired at an angle of 45° with the same muzzle velocity the projectile would land on the ground—provided there were no air resistance and the earth were flat—at a distance of $2\ s$ from the gun. And the peak elevation along the trajectory would be $s\ 2$.

First we have to interest ourselves in vertical shots. The formula is simple, it is the square of the muzzle velocity divided by $2\ g$. If we imagine a rather weak gun with a muzzle velocity of only 250 meters per second—about 818 feet per second—this works out as follows: 250 times 250 = 62,500 divided by 19.62—which is 2 g expressed in metric units— = 3,185.5 meters. Since there are 1000 meters in one kilometer the result is 3.2 kilometers or about 10,615 feet.

When we first look at Table I we are interested only in the two columns at the left. Under the heading of v_m which is meant to be read as "muzzle velocity" in this case, we find progressively larger velocities entered, expressed in kilometers per second. In the second column we find the altitudes that shells fired with these muzzle velocities would reach if there were no air resistance. For a reason which will be discussed

TABLE I.

TABLE OF COMPARATIVE ALTITUDES, ROCKET AND GUN ASSUMING NO AIR RESISTANCE.

Velocity v_m (km. per second)	Gun s (km.)	Rocket (with 3 g eff. acceleration) h (until v_m is reached) (km.)	time required for h (sec.)	s + h (km.)	Actual, (including reduction of gravity) (km.)
0.5	12.7	4.3	17	17	17
0.8	32.0	10.9	27.2	43.5	43.5
1.0	51	16.8	33.8	67.8	68
1.5	114	38.3	51	152.3	155
2.0	204	67.4	67.7	271.4	277
3.0	459	153	102	612	640
4.0	815	269	135.4	1084	1310
5.0	1274	424	170	1698	1970
6.0	1835	612	204	2447	3820
7.0	2497	834	238	3331	6140
8.0	3262	1080	271	4342	11,950
9.0	4128	1377	306	5505	29,530
9.5	4599	1535	323	6134	68,400
11.18	6371	2124	380	8495	∞

soon the figures in the second column should not be taken too much at face value—beyond 1000 kilometers they are surely wrong as we'll see.

But now we come to high altitude and long-range rockets and the first question that comes up is whether there is a way of comparing rocket altitudes in some manner with the figures we just looked up in the table. A rocket, as everyone knows by now, does not start out with a high velocity but acquires it gradually. It continues to rise with increasing acceleration and increasing speed until its fuel supply is exhausted. That point where the rocket motor stops working, marks the maximum velocity of a rocket, provided it is well designed. And because it marks the rocket's maximum velocity it is this point which must be compared to the gun muzzle if a comparison between guns and rockets is to be drawn.

The first job, obviously, is to find the point where the rocket reaches maximum velocity. Now look back at the table, this time we read the v_m of the first column as "maximum velocity," the third column shows how high a rocket with a steady acceleration of 3 g will have climbed until reaching maximum velocity. A rocket accelerating with 3 g is pretty fast and the heights are rather considerable. The fourth column is not really required, it is there merely for interest's sake and shows the number of seconds the rocket needed to climb to that altitude. The next column is labeled s + h, and merely the addition of rocket altitude until

v_m is reached and the "gun altitude" which has to be added to it because a rocket with a velocity of, say, 1.5 kilometers per second—and with a no longer working motor—naturally behaves just like an artillery projectile with that muzzle velocity.

But while the figures in the column s + h are fairly close to the truth for the interval between 40 and 600 kilometers they go more and more wrong the farther down in the column you go. The reason is that in that simplified calculation it had been assumed that the gravitational attraction of the earth is just as strong a thousand kilometers from the surface as it is at sea level. Of course it is actually weaker, getting gradually less and less. The very last column in the table, the one at the extreme right hand, takes this factor into consideration. It shows how high a rocket accelerating with 3 g would actually go, not counting air resistance.

Now we could imagine that the rocket has a booster unit which carries it to about twenty miles first in order to overcome the resistance of the densest layers of the atmosphere near the surface—in that case we could take the figures in the right-hand column virtually at face value.

It is interesting that the gradual reduction of gravity makes very little difference at first. The rocket which by the simplified method was calculated to climb to an altitude of 271.4 kilometers will actually go to 277 kilometers, the rocket calculated to go to 612 kilometers will actually go to 640 kilometers. These differences hardly count, the designer who designs a rocket for an altitude of 270 kilometers will be very happy to find it anywhere between 255 and 285 kilometers. But farther down in the column the differences between detailed and simplified calculation become more than just noticeable. The rocket with seven kilometers maximum velocity would go 3331 kilometers according to the simplified method, actually it would be 6140 kilometers.

The biggest possible difference is, of course, the one in the bottom row, where simplified calculation emerges with an altitude of about 8500 kilometers which would be roughly three quarters of the diameter of the Earth. Actually the altitude is plainly and simply infinity, any distance in interplanetary space.

After having disposed of the altitudes we can proceed to ranges, and begin again with guns where things are—or rather can be made to be—somewhat simpler. Diagram I illustrates the case of a 45° shot on a flat surface. The gun is located at O or zero, shooting to we don't know where and call it X. The distance SL is what the vertical altitude would be if the gun were standing in S. The peak elevation along the trajectory, SP, is half of SL. And the range OX is four times SP. The curve from O to X is theoretically a parabola and for this reason a range calculated in that manner, with an assumed flat Earth, may be and often is referred to as "parabolic range."

Table II shows in its second and

third columns the parabolic ranges and peak elevations for a number of cases of muzzle velocity.

If v_m does not mean muzzle velocity with respect to a gun projectile, but means maximum velocity with respect to a rocket, we again need a correction. The rocket shot in Diagram I goes from O_1 to X_1. For the distance from O_1 to O the rocket motor is working and the rocket is under acceleration, but under 45° the rocket does not climb as high as it did vertically. The distance added to the range at take-off is the distance from O_1 to the point vertically below O which is called B on the diagram. Since the—shaded—triangle is an equilateral triangle the distance from O to B is the same as that from O_1 to B.

mind, of course, that OB changes for every velocity which we assume. The results of such calculations can be seen in the two right-hand columns of Table II.

These, however, are merely parabolic ranges, ranges calculated under the assumption that the Earth is flat. As long as the ranges are short that does not matter much, neither General Congreve of early war rocket fame nor Commander Dahlgren of naval gun fame were greatly troubled by the difference between "parabolic range" and "actual range". They still worried mainly about uniformity of propellant powders and uniformity of alloys, and they worried a little about air resistance which they found experimentally. We take uniformity

TABLE II.

RANGE TABLE.

Without correction for air resistance and without correction for earth's curvature and diurnal rotation.

v_m (meters per second)	Gun		Rocket	
	Range (45°) (km.)	Peak Elevation (km.)	Range (km.)	Peak Elevation (km.)
500	25.5	6.35	31.5	9.4
800	65.2	16.3	80.6	24.0
1000	102.0	25.5	126.0	37.4
1500	228	57	282	84
2000	408	102	503	150
3000	918	229.5	1135	338

The same distance is added at the other end—not quite, since the line from X to X_1 should not be straight but curved—and for a first approximate result we find the rocket range to equal the gun range plus 2 OB. It has to be kept in

of constructional materials for granted and we know a little more about air resistance although even now the experiment very often has the final say-so. But we are concerned about the difference between parabolic range and true range.

The point is that the curve of the trajectory is not a parabola but an ellipse. Diagram II shows how a 7000 mile rocket shot might really look. To calculate it is anything but a Sunday afternoon's diversion. First the ellipse belonging to a certain velocity and angle of elevation has to be established. Then the angle OCS_1 can be found, and from that angle OCX. From then on it is only a half hour's job to find the distance OSX.

Unfortunately I am not able to add two columns to Table II giving ranges calculated from elliptical paths. This proved to be impossible for two reasons. The more important reason is that a man has that much spare time and he can get along on just so little sleep. An additional reason is that I own nothing better that a 7 place logarithm table, which is not quite enough for such a job.

But I can offer a table of approximations. Table III calculated by means of a method illustrated on Diagram III. We see on Diagram III a section of the Earth's surface, with the flat parabolic OX range superimposed. The lines terminating in arrowheads and marked C are lines pointing to the center of the Earth, they are what would be called vertical in the points O, K and X_2. Now the parabolic range would end up in point X, but the projectile would still traverse the distance from X to X_2. If we project the parabolic range onto the surface where it would fall between K and X_1—but closer to X_1—and add the height of X over the surface, XK to the distance OX_1 we'll get a reasonable approximation of the distance OX. Naturally all this is valid for 45° shots only.

But I'll not waste any more time with methods. Table III shows the parabolic ranges from Table II and the corrected ranges. The correction was tested on an available figure calculated for an elliptical

TABLE III.

RANGE TABLE.

For artillery projectiles and rockets fired at 45° elevation. Without air resistance, but with correction for Earth's curvature. (Approximate correction used is valid for 45° shots only.)

v_m (meters per second)	Gun			Rocket		
	Parabolic range (meters)	Height of point X (meters)	Corrected range (meters)	Parabolic range (meters)	Height of point X (meters)	Corrected range (meters)
500	25,500	50	25,550	31,500	85	31,585
800	65,200	330	65,530	80,600	510	81,110
1000	102,000	820	102,820	126,000	1,240	127,240
1500	228,000	4,072	232,072	282,000	6,240	288,240
2000	408,000	13,490	421,490	503,000	19,840	522,840
3000	918,000	65,800	983,800	1,135,000	100,325	1,235,325

trajectory and a muzzle velocity of 820 meters per second. Calculated by the method shown in Diagram III the range would be 68,882 meters. The true range is 68,985 meters, if the figures were rounded up to the nearest full kilometer, namely 69, the difference would not show at all. At least in the lower ranges Table III cannot be too far off.

The result of all this work is that a missile of the type of the V-2 rocket would shoot some 31 kilometers -roughly 20 miles—if its maximum velocity is ½ kilometer or 500 meters; that it would shoot some 80 kilometers --about 50 miles --if its maximum velocity were only 300 meters—about 1000 feet—higher than that of the first; that it would reach 127 kilometers—80 miles—with a maximum velocity of 1000 meters per second and 288 kilometers—about 178.5 miles—with a maximum velocity of 1500 meters per second. The last figure agrees nicely with the actual performance of V-2 which had a maximum velocity of 1600 meters per second and a range just short of 200 miles.

With a maximum velocity of 2000 meters per second a range of about 523 kilometers—324 miles—can be expected and with a maximum velocity of 3000 meters per second the range would jump to some 1230 kilometers or about 760 miles.

It might be of value at this point to compare the known or probable performances of the various kinds of shooting for several sets of ranges.

BATTLE RANGE, up to 8 miles

Within that range the use of atomic bombs or atomic warheads is impossible, hence the lessons of World War II apply rather well. Within that range artillery has superiority of accuracy, while bombardment rockets have superiority of volume. Which will be chosen will depend entirely upon type of target and

TABLE IV.

TABLE OF MASS-RATIOS FOR LONG DISTANCE ROCKETS.

Exhaust velocity c (meters per second)	v_m = 500 Range = 31.6 km.	v_m = 1000 Range = 127 km.	v_m = 2000 Range = 523 km.	v_m = 3000 Range = 1,235 km.	v_m = 8000 Range = Orbital
	Mass-ratio	Mass-ratio	Mass-ratio	Mass-ratio	Mass-ratio
500	2.72	7.4	54.5	405.0	894,880,000.0
1,000	1.64	2.72	7.4	20.0	2,987.0
2,000	1.29	1.64	2.72	4.48	54.5
3,000	1.18	1.39	1.94	2.72	14.35
4,000	1.13	1.29	1.64	2.11	7.4
5,000	1.10	1.22	1.49	1.82	5.0
10,000	1.05	1.10	1.22	1.35	2.22
20,000	1.02	1.05	1.10	1.16	1.49

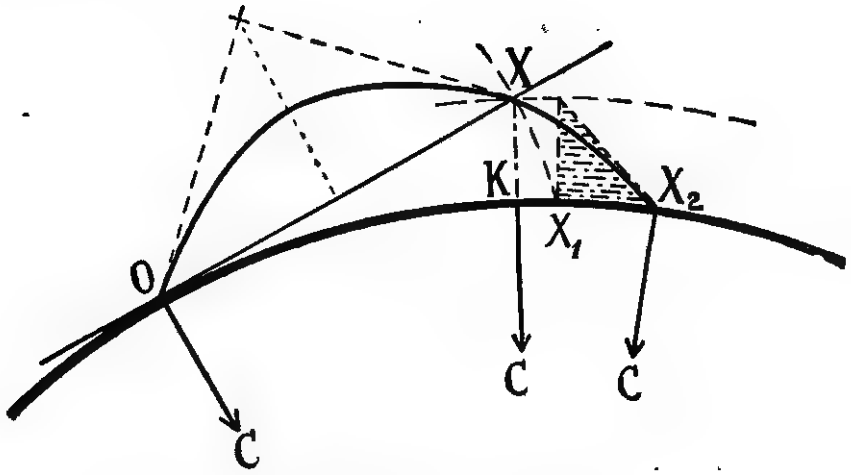


Diagram III: Simplified method of calculating rocket ranges ignoring change of gravity.

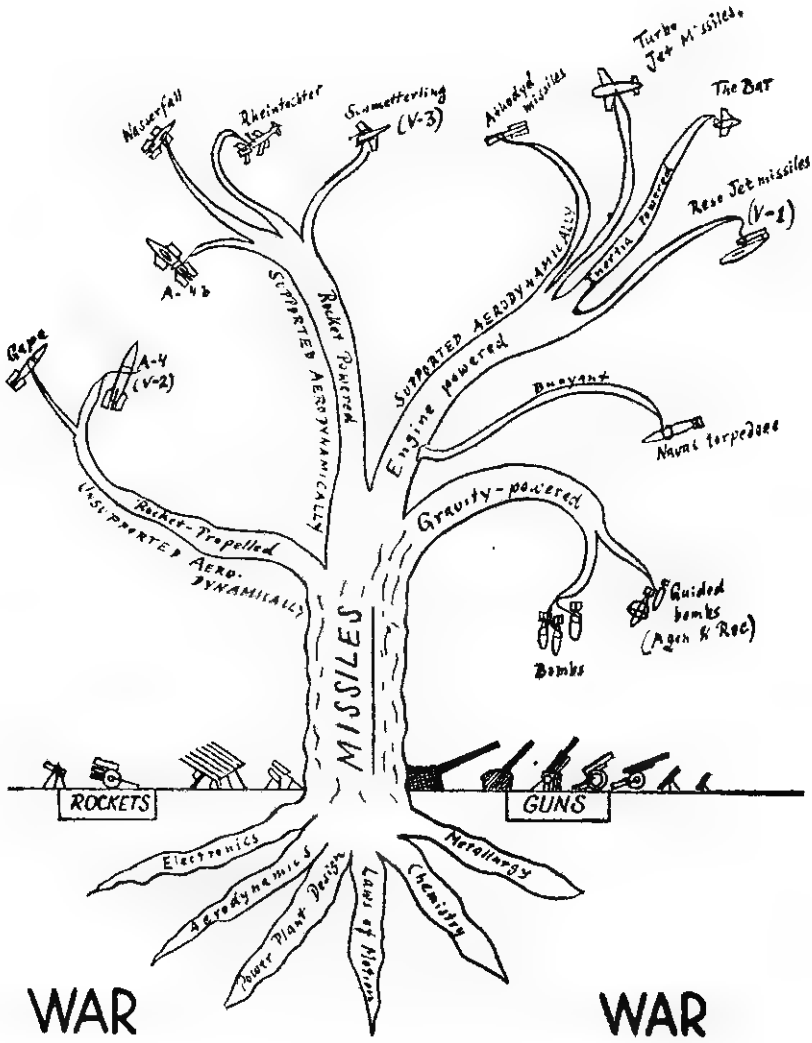
conditions of terrain et cetera, the point is that not one or the other but both must be supplied. Some of the jobs—like firing from aircraft—which were given to bombardment rockets will go to recoilless guns which are more accurate and weigh less. For any given size it will hold true almost always that the gun will weigh about as much as eight rounds of rocket ammunition. As soon as more than a dozen rounds can be carried by the plane, the weight factor will shift in favor of the recoilless gun, which has higher accuracy in its favor to begin with.

Guided missiles may turn out to be of even higher accuracy than artillery within battle range, provided that guidance cannot be interfered with by the enemy.

LONG RANGE. This is beyond battle range up to about 120 miles. Within that range artillery is possible but fantastically expensive. Moreover the volume of fire which long-range guns can deliver is small. Therefore artillery over such ranges could be considered only if the shells could carry atomic explosives. This does not sound likely, but, if it should prove possible, the verdict may well be in favor of artillery even for long range, since the probability of intercepting an artillery shell is very slim indeed.

Because of the atomic bomb—but only for that reason—aerodynamically supported missiles—like V-1—and long range rockets—like V-2—are of about equal value over ranges up to 120 miles. The competing facts are these: the missile is much

The Family Tree of the missiles. Probably the first type of all was the catapault-launched (ye stronge right armme) followed by the gravity-powered (or cliff-borne) bomb.



cheaper to make, there were about 800 man hours of labor in a V-1 flying bomb, but 13,000 man hours of labor in a V-2 rocket. With good interception, however, it might take many more man hours per missile which reaches the target than per rocket which reaches the target. If only chemical explosives were available, the choice between rocket and missile would depend on the effectiveness of enemy interception. With atomic warheads it does not matter much, to intercept a missile over a city would be just as bad for that city as noninterception. The choice would actually be dictated mostly by the price and availability of atomic explosives. If atomic explosives remain scarce and difficult to manufacture, or are outlawed, the long-distance rocket would be the choice.

VERY LONG RANGE, beyond 120 miles. Here the field belongs virtually exclusively to the long-range rocket. Of course aerodynamically supported missiles could be made to travel 500 or 600 miles or more, but even if the missiles carry atomic warheads the chances for successful interception increase with distance. The more room there is between the point of interception and the target, the safer it is to intercept the missile even at the risk of detonating the atomic warhead. Over all ranges the competition between long-range rockets and piloted aircraft would depend entirely on the density and effectiveness of interception—an enemy who has grown weak enough to be bombed manually is no longer much of an enemy.

Since, by virtue of the atomic bomb, the long-range rocket has become the most reliable long range weapon, it remains to look for limitations of the long-range rocket itself. There are mainly three. One is the increasing take off weight with longer and longer ranges, which may come to a point that cannot be built any more. The other is the possibility of the rocket's "incineration" during descent. The third is the problem of guiding.

The first question is answered by Table IV. Across the top of that table a number of maximum velocities have been entered along with the ranges obtained by these maximum velocities. At the left a set of exhaust velocities for the rocket motor have been entered. The figures under the word mass-ratio then indicate the ratio between take-off weight of the rocket and the "weight of arrival", meaning empty rocket plus warhead.

If, for example, your rocket motor produces an exhaust velocity of 2000 meters per second—the V-2 motor did that—and you have to fire over a range of 31 kilometers, the take-off weight of the rocket has to be 1.3 times the "weight of arrival". If you want to fire over a range of 127 kilometers, the take-off weight has to be 1.6 times the "weight of arrival" and so on. Actually the take off weights have to be somewhat higher, because the table assumes that there is no air

resistance. This increase would show the more the shorter the range.

At present there is no practicable rocket motor known which can even produce an exhaust velocity of 3000 meters per second. And even in theory 4000 meters per second is the limit for chemical fuels. If atomic energy could be utilized for propulsion too, the exhaust velocity might be stepped up to 20,000 meters per second, the table gives the mass-ratios for these hypothetical high exhaust velocities.

But the table also shows one factor which is highly interesting; it means that for most practical purposes there is a limit to the exhaust velocity which needs to be attained. Let's pick out a case from the table which will illustrate what I mean. In the column below the maximum velocity of 2000 meters per second you find that the mass-ratio would have to be 54 to 1 if the exhaust velocity available were only 500 meters per second. That, obviously, is too high when it comes to design and construction. If an exhaust velocity of 1000 meters per second were available, the mass-ratio required drops to 7.4 to 1. This is already within the realm of what the engineering department could accomplish although so far no rocket of such a high mass-ratio has been built. If the exhaust velocity were increased to 3000 meters per second, the mass-ratio required would be roughly 2: 1 which is quite easy to build—V-2 had better than 3 to 1. If the exhaust velocity were increased to 4000 meters per second the mass-ratio required would be only 1.64 to 1 which is, of course, still easier to build.

To increase the exhaust velocity from 4000 meters per second to 5000 meters per second might be a very difficult job, but the gain in mass-ratio is not too important any more. It is now 1.49 to 1 instead of 1.64 to 1. Such a gain would hardly simplify construction, while the increase in exhaust velocity may be enormously difficult.

The same reasoning can be applied to almost any other column in the table, whatever the example there comes a point where the gains in reduced mass-ratio from increased exhaust velocity become unimportant.

To obtain an easily built mass-ratio it is sufficient to have an exhaust velocity twice as high as the maximum velocity required. Higher exhaust velocities are nice, provided they can be had cheaply. But only then.

The combination of exhaust velocities which can be had, and of mass ratios which can be easily built, limits the range of the single long-range rocket to about 700 miles for present day fuels. The emphasis in this statement is on the word "single", a rocket with booster units for take-off, or multiple rockets could naturally obtain longer ranges.

But the longer the range the more serious the danger of "incineration" by which term I mean the heating of the rocket caused by compressing the air in its path. Londoners under V-2 fire on occasion saw the descending rockets glowing dull red. Every once in a while the residue

of fuel in the tanks exploded the rocket before it reached the ground. The Germans had to take the precaution of choosing a high-explosive for the warhead which can be heated up very considerably without exploding.

This factor naturally increases with increasing distance since increased distance means increased maximum velocity. Now the rocket is excellently suited to cope with this factor during take-off. The closer to the surface, the denser the air, and the slower the rocket. There is virtually no danger of heating up on the ascent and it helps that the fuel tanks, still fairly full, could also absorb a goodly quantity of heat with effects that are beneficial rather than detrimental. Besides, the velocity at take-off could be adjusted to avoid such danger if it should become apparent.

But you can't adjust the velocity of the falling rocket.

Pulled down by gravity it has the tendency to increase its velocity more and more, entering denser and ever denser layers of the atmosphere in the process. It might well be that long distance war rockets will burn up when fired beyond a certain—and as yet undetermined—range.

But it is also very likely that the warhead could be insulated sufficiently to reach the ground in one piece, even if the rocket does not.

And that brings us to the limitations imposed upon guiding.

A long-range rocket can be guided best while climbing, when the rocket motor is working. After the rocket motor has been shut off there is no way of guiding the rocket any more, not because it is no longer powered—it is still powered by very large quantities of kinetic energy—but because the air around the rocket, if any, is far too thin to make the rocket respond to movements of the fins. Guiding becomes possible to a certain extent on the way down, when denser layers of the atmosphere have been reached again. But when that happens the rocket is so far from the firing range that it is below the horizon. To guide it on the way down would require the presence of a guiding station not too far from the point of impact, for example high flying aircraft circling in the general vicinity of the target.

Of course you might say that they would not circle there very long if the enemy is even mildly alert—and I agree with that statement. The solution to the guiding on the descending path might, but only just *might*, lie in the orbital rocket. If a rocket attains a maximum velocity of 8,000 meters per second, it will not return to earth any more but circle the earth indefinitely in an orbit outside the atmosphere without any fuel expenditure. If we imagine three such orbital rockets circling the Earth, spaced 120° apart, one of the stations would have any given point on Earth accessible to radar waves at any moment.

By the time technology has progressed to establishing orbital ob-

servation rockets it automatically has also progressed to orbital war rockets with atomic warheads. That being the case, the orbital observation rockets would not need to pick up long-distance rockets fired from somewhere on Earth and guide them —they could just direct orbital war rockets down to their targets.

But if two countries of about equally highly developed technology were preparing for war with each other, even the orbital rockets would not constitute much of an advantage. Both the observation rockets and the orbital war rockets would be in well-determined astronomical orbits about the Earth, without power to influence these orbits except within relatively narrow limits, also well-determined.

Neither their positions nor their numbers could be kept secret, they would be quickly revealed to search radars of the other nation. And it would not be too hard to have a dozen interception missiles ready for each one of the orbital rockets, to be released at the very first sign of the opening of hostilities, before any of the orbital war rockets had time to fall very far.

THE END.

THE ANALYTICAL LABORATORY

This month's Lab report is rather unusually sharply divided. *Quite* clearly, the June issue was made up, in the reader's opinion, of two major stories, and a group of interesting minor ones. Note the point score distribution!

Place	Story	Author	Points
1.	Fury (pt. 2)	Lawrence O'Donnell	1.57
2.	Centaurus II	A. E. van Vogt	1.91
3, 4, 5	Dead Heat:—		
	Letter To Ellen	Chan Davis	
	The Model Shop	Raymond F. Jones	3.61
	Errand Boy	William Tenn	

Or, in other words, the disagreement on which of the last three belonged in second place was 100%!

THE EDITOR.

CAN V-2 BE IMPROVED?

BY DAVID A. ANDERTON

***Improvement** on heavy rockets is not always as straight-forward a job as it first appears. Changing A may require an elaborate series of changes in B, C, D—and A!*

Ever since reading Willy Ley's highly interesting conjectures about the performance of an improved V-2—(Astounding Science-Fiction, January 1947)—I have felt it necessary to argue with some of his concepts. First, let's understand that his major two theses are correct; it is possible to achieve improved performance by bettering the weight ratio of the V-2, and it is definitely true that the purpose of the final design determines the form and configuration of the rocket.

In looking at Ley's article, and my rejoinder, remember that the intent is to improve the V-2 by elimination of "excess" weight in a standard model. We have ruled out any changes in the power plant section because such changes would require additional research. But we're kidding ourselves when we do that, because in the engine compartment lie most of the possibilities for real improvement of the V-2. If we can get better fuel-oxidizer combinations, or lighter and smaller engines, the V-2 will become a far more valuable research tool than it now is.

Perhaps it is not so well known that the performance change of a rocket is more dependent upon changes in the exhaust velocity than changes in weight. This shows up in the classic formula for the final velocity of a rocket in a vacuum,

$$\text{Final velocity of rocket} = (\text{exhaust velocity}) \times \log_e \frac{\text{initial weight}}{\text{final weight}}$$

So it's apparent that we get more returns by increasing the exhaust velocity than we do by lopping off pounds here and there. Of this, more will be said later.

We might argue for a while on the sloppy workmanship and crude finish of the V-2. I have seen several examples of the V-2 or parts, and was really surprised at the quality of the work. It was far better than I ever expected slave labor to produce. And compared to the standards of United States wartime aircraft finishes, the V-2 was rather lovely. (I exclude here the two classic exceptions the P-51 Mustang wing finish and the piano-top surface of the P-80 Shooting Star.) But, as in all such cases, there are good examples and bad examples; Mr. Ley and I undoubtedly saw ones from different batches. And, arguing that the purpose determines the form, suppose that the V-2 finish was a poor job—on an expendable missile, who cares? They're not to look at, but to kill with. Paint them to camouflage them, or to stop them from rusting, but let it go at that.

But those perfectly useless fins! Now there is a sore point, because I am an aerodynamicist, and believe mightily in the importance of stability and control. Just suppose that the V-2 had no fins, and that it started to descend through the atmosphere on its way to the target. As soon as the air density got to be appreciable, the missile would experience some kind of an air force on it. Since the V-2 would be descending in a rather tail-down position, at an extremely high angle of attack, there exists the probability that the missile would start to tumble end over end, or even continue on in about a horizontal position; in any event, the drag increase would be terrific. These changes in drag greatly affect the descending path toward the target, and the dispersion of the V-2 would be ten, fifteen or twenty percent of the range, instead of the one percent the Germans obtained. That alone is good and sufficient reason for the fins *on a missile.*

An elementary consideration of the aerodynamics of static stability is necessary from here on in. Stability is very worthwhile, like low drag; and having stability, it is also nice to have a certain amount of control, so that the gadget will go where you want it. In an airplane, this is done by the location and design of stabilizing and control surfaces—the stabilizer and fins for stability, the rudder, elevator and ailerons for control. That works fine where there is some air for the surface to deflect, but what about a rocket? What happens after the power cut-off that renders the *jet* vanes completely useless?

It happens that the restoring moment supplied by any stabilizing surface is proportional, among other things, to the dynamic pressure, which is the product of the air density and the square of the velocity. Let's look at the variation of the dynamic pressure for a few typical points along the V-2 flight path. First, at sea level; the rocket is at a standstill, and apart from any airflow induced around it by the jet,

the air velocity is essentially zero. Therefore, the dynamic pressure is zero, and so is the restoring moment. Hence the need for jet vanes, to deflect the high-speed exhaust and make it work at control as well as propulsion. At the three-mile level, where the speed of the V-2 is about that of sound, the dynamic pressure can be calculated as 814 pounds per square foot. At the final point of cut-off, about eighteen miles up, the speed of the V-2 is five times that of sound, and the dynamic pressure has dropped to only 545 pounds per square foot, which is still a very sizable value. And from here on up, the jet vanes are not working; only the external fins and rudders can supply the necessary forces normal to the flight path to insure that the pre-determined trajectory of the V-2 will be closely followed. This is all closely related to the positions of the centers of pressure and gravity for the V-2.

The center of gravity is well known as the point of application of the resultant weight force on any body. For the V-2, the CG position moves aft with time as the fuel is burned. It is farthest aft when the weight of the remaining fuel equals the weight of the tanks, and from then on, moves a little forward until the fuel is all burned. The center of pressure is similarly the point of application of the resultant air forces acting on the V-2. It so happens that on the V-2 *with fins*, this CP lies aft of the CG, which is a very essential criterion for stability. This means that if the V-2 assumes some small angle of yaw or pitch because of a disturbance, the air loads will increase aft of the center of gravity and tend to swing the missile on course again. This principle is more familiarly used in the weather vane.

Tests of the V-2 show that the center of pressure moves forward as the speed increases. We have already seen that the center of gravity moves aft with time, or an increase in speed, and so it is apparent that the most critical condition of near-instability occurs when the V-2 is nearing fuel cut-off, when the CG is farthest aft, and the CP is farthest forward. In the meantime, the jet vanes have been eroding, and their effectiveness has been getting lower, so that as the cut-off is approached, the external surfaces just have to take over. It is a safe bet that the size of the control surfaces and the fins has been calculated to provide for this condition of high-altitude stability.

Even if the rocket is limited to a vertical trajectory, eliminating the fins is not good. Suppose the V-2 passes power cut-off fine, and then a little farther up, gets smacked across the nose by a stratospheric wind, and deflected about 10° off course. What happens? Well, with luck, it might not break up in the air, but it would certainly never get much higher. But just leave those "perfectly useless" fins sticking out in the breeze, and the nose swings back on course.

The next argument concerns the elimination of weight. If the warhead is replaced by only a wind-

shield, the center of gravity is immediately moved aft a considerable distance. By removing the fins, it is true, the CG does move forward again, but by 750/2200 of the distance it moved aft. But worse than that, by removing the fins, the center of pressure has moved forward by a very considerable amount, and the missile is immediately unstable.

To belabor this problem of weight saving a little farther, where is the extra 550 pounds to be saved "all the way down"? We ruled out the power plant bay, and have already removed the warhead, four fins, their controls and some insulation. I doubt that the shell structure could be built much lighter, and for any greater accelerations—presupposing the V-2 *could* be made lighter—the tanks would have to be stronger, which makes them heavier. Just where is that 550 pounds to be found? And the instrument allowance of 100 pounds should include a parachute, which must weigh something. If it is a service model, then 20 pounds is good and sufficient, but the Germans, and later the United States Army Air Forces, found that the conventional type of chute as we know it was not much good for the parachute recovery of missiles or their contents. So we had better include the ribbon type chute that the Germans developed for high-speed recovery, and that will surely weigh more than 20 pounds, perhaps even twice that.

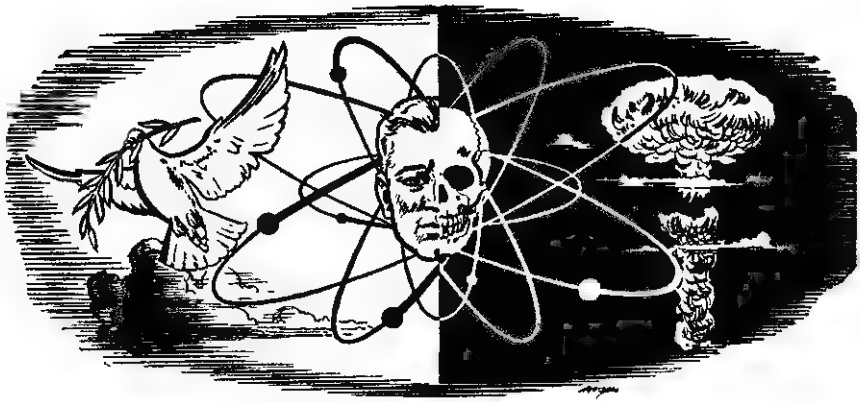
It seems that all this has not left much room for improvement, has it? And the reason it hasn't is because there is not a great deal of room for improvement unless we do develop the power plant section, the only item that we ruled out before. We must look for continual progress in rocket motor technology, and the use of more powerful fuel-oxidizer combinations in order to realize any substantial boost in the performance of the V-2.

THE END.

EXPLANATION . . . ?

Carbon and nitrogen are normally regarded as two of the least active of the chemical elements that react at all. But at temperatures over 3000° C., carbon and nitrogen compounds are among the few types that survive—cyanogen is detected even in the Sun. A newly formed planetary mass, as it cooled to temperatures where chemistry became possible, would form carbides and nitrides even before oxides were possible; a still incandescent planet would have vast masses of metallic carbides and nitrides. The first rains that fell, however, would break these down to metallic oxides, and hydrocarbons, on the one hand, and ammonia or amino-compounds on the other. A mixed soup of hydrocarbons, amino acids, and ammoniated compounds would result—literally, oceans of 'em.

Recently, a couple of Harvard chemists made a little discovery—simple amino acids, left to themselves in a benzene solution with a little water, copolymerized to produce true, high-molecular weight proteins—the basic stuff of all living cells. Some living, or quasi-living things, like viruses, for instance, are, in fact, nothing more than complex protein molecules.



THE END IS NOT YET

BY L. RON HUBBARD

***Second** of three parts. The essential trouble with belligerent people is that they're sure they're right, their ends are good, and they'll do anything to prove it. Murder and mayhem and war, for instance—*

Illustrated by Rogers

Synopsis

*CHARLES MARTEL, **nuclear physicist has** left the employ of the Allied War Crimes Commission in Europe because*

*CONNOVER BANKS causes the **useless execution of a famous psychiatrist who is part of a** scientific group seeking to prevent an atomic war. Banks is a partner and employee of*

JULES FABRECKEN, fascist industrialist whose international empire of business neatly survived another employee—Adolf Hitler. Fabrecken desires to monopolize all world industry and so rule. To do this he must promote an atom war between America and Russia and prevent further scientific discovery. Preventing him is

*PROFESSOR HAUS, **ex-Nazi**, who is intelligence chief for high-ranking scientists who **have their** headquarters **in the High Atlas of** Africa. Haus contacts Martel **who** has married*

ANNE VON STEEL, daughter of the executed psychiatrist and who keeps house for Martel and their adopted boy,

BUCKINGHAM, a British waif abandoned early in the war on the continent and who has learned much of starvation and cunning.

In Biarritz Haus makes an appointment with Martel to show him the scientific personnel files.

Buckingham follows Haus when he leaves Martel's house.

PART 2

At eight thirty that night, Mr. Connover Banks and certain servile gentlemen, all businesslike and carefully instructed, walked quietly into the Street of the Scalded Cat and approached the rickety old tenement which Martel had been given as Haus' address.

There was a quiet, cool breeze flowing down the curving lane, most welcome after the day's warmth, and a pleasant three-quarter moon was rising above the rugged hills. A few loiterers stood about on the walks or leaned against crazy walls or rickety lamp-posts. A few lights glowed warmly from the flat-fronted buildings.

Mr. Connover Banks hung back with prudence indicative of both great intelligence and, at the same time, an awareness of importance in that he could not permit himself to be unduly careless and risk robbing the world of his inestimable services.

There was a sort of court, opening through an arch on the street, which separated two buildings and inspired each with a tangle of fragrant greenery at once affording the occupants with scenery and a convenient place to dump undesirable fluids and garbage. The northernmost house had a small balcony from which a stairway led down into the court, and after some consultation aided by roughly collaring an urchin and almost rubbing his nose off with badges, Professor Haus was discovered to live in the room just off this balcony and to the right as one went up.

Very discreet indeed now, Mr. Connover Banks saw the splendid Gritter—who had just set the urchin aside with a pleasant promise that his head would be twisted off if he so much as made a whimper or moved—post two men, one on either side of the arch, station a third at the bottom of the staircase and then heavily grind up the steps himself with two more at his heels.

A moment after Gritter disappeared off the balcony there was a shriek inside the building which struck the street active and then deserted and numb, after which Gritter reappeared on the balcony and motioned an all well.

At this the two men outside the arch withdrew inside where shadow would mask them, the stairway sentry went out of sight under them and Mr. Connover Banks, followed by a peculiarly weaselish little animal, went smilingly under the arch, up the stairs and, with Caesarian confidence, entered the area of his conquest.

He found Professor Haus senseless in the middle of a shabby room

and despite the quantity of gore which was smearing itself on the rug from the quarry's mouth, saw that the fellow was still breathing.

"Good work, my excellent friend," said Banks to Gritter.

"I just try to do my job," rasped the modest fellow. He kicked a Luger out from under the table and, without too much ostentation, pocketed it.

Mr. Connover Banks drew an apple out of his pocket and bit at it. He looked around the room and was not much impressed with what he saw.

There was a small, white painted iron bed, a chair with the cane missing from the seat, a dry goods box which served as a dresser, a chest which contained a few clothes and a table which sat wearily on the unpainted floor burdened by a great mass of old books.

Banks examined the books and found them to be in German or Russian and as both these languages were considerably out of his line he found it easier to hire linguists—dismissed them. He turned to the weaselish person and nodded an understood command.

With the enthusiasm of a terrier hot after a rat, the person went at it. He tore up the mattress and he ripped the clothes in the chest, he burrowed into the dry goods box and he thrust a knife everywhere through it for secret panels, he got a board or two off the floor and some plaster off the wall and ceiling. And, in short, searched the place with so much confusion and with so many dartings and stabbings that one would have thought him berserk if one did not realize that he worked under the direct gaze of Mr. Connover Banks. Disheveled then and panting until his watery eyes started, the person stood helplessly before his master.

"Nothing here," he reported.

Banks smiled pleasantly at him. "I'm somewhat disappointed in you, Feak. You had better look again."

Feak darted back to work and he tore up more boards and ripped up more plaster until the air under the bare electric light was smoking with dust. All the while he worked Feak sniffled and sniveled as though greatly aided by his nose, which, by any standard of area or angular measure was a very large nose indeed.

He came back to Banks. He shook his head in a vigorous negative. Banks pointed to Haus on the floor. He did not like this senseless brutality but it was urgent that he obtain the information which only Haus knew. Further, it was necessary to play up to these men who served him, for he could not permit himself to be weak in their eyes. He began to doubt that he would get anything out of Haus. But perhaps if he applied methods which the old Nazi best understood they would yet achieve their end. He turned his back on the scene for he did not enjoy it. The thud of Gritter's knuckles seemed to be jarring him instead.

At last Feak reported, "Nothing! He will say nothing," said Feak. As though all the time he had been oppressed with the feeling that Haus

might make a quick confession of it and was just now beginning to be hopeful that Haus would not. He went back at it and there was more noise.

Mr. Banks looked at his watch. It was a fifteen hundred dollar watch and it told the time and the day and month and year, and it gave the phases of the Moon and even changed for the millennium. He admired the watch for a little while and then saw that it was nearly nine.

Mr. Banks turned and stuck a two-dollar cigar in his mouth. He put his hands behind his back and rocked from heel to toe. He peered through the folds of fat at the bloody mess which was tied to the chair.

Gritter was unruffled but Feak was dancing about like a flyweight daring his opponent to strike. He was perfectly safe in this for Haus was unconscious and tied besides. Feak was moist with sweat and shivering excitedly. His collar was unfastened and his cuffs were turned up.

"Ha, ha, my dear Feak," said Mr. Banks. "What a card you are, surely. But no more of this just now. We must be very quiet for a while. I think probably our dear friend here will soon have visitors. It was to be nine, wasn't it, Gritter?"

"Nine o'clock," said Gritter, polishing his hands together to get the numbness out of his knuckles. "I set up the amplifier and I listened and that's what I heard them say."

"And what else did you hear?" said Banks.

"Why, nothing."

"Nothing?"

"They came to the door and that's all the work we could make the amplifier do."

"Now, now, my dear old friend, please think about it. You heard them say nothing but that?" And Banks gave his employee a ponderous and witty wink.

"Wake up," said Feak to Gritter. "He isn't asking you to think. I'll tell you what to say if the time ever comes." And he looked imperiously up at the huge Gritter.

"Oh, that," said Gritter. "Of course. You're the boss, Mr. Banks. I just do my job."

"I'm sure you do, Gritter. I'm sure you do. Ha, ha. And a very good job you do. Well now, is our friend here going to be out all night?"

Feak danced over to the cracked water pitcher and moistened a dirty towel. He darted at Haus and began to scrub away at his face, pummeling him on the back of the neck the while.

Either the pain or the coolness of the water or both brought poor Haus around again. He dazedly sought to peer through the wrecks of his eyes and to right the rocking room.

He saw Banks. "Who are you?"

"Never mind who he is!" screamed Feak, dancing back and forth in front of Haus and waving the bloody towel. "Just tell us where all your papers are or you'll get it. If you don't tell us where they are now, we'll work on you again later.

And when you don't tell us then, why there's a place near here that is just right for your kind. All the modern improvements. All the best and most beautiful improvements. Just tell us where you hide your papers and who your friends are and you'll quietly hang. But if you don't —"

Banks laughed. "Feak, my friend, to listen to you one would think you the most bloody-minded creature on earth!"

"I'll make him talk," said Feak. "I've a world of experience with these fellows. So long as Gritter's knuckles hold out, you'll talk, criminal. You'll talk! Now where do you keep your papers?"

"Enough now," said Banks. "I think we had better be quiet. We might scare the birds away, you know."

"The birds," said Gritter. "That's very good, Mr. Banks."

"I von't do any talking," said Haus. "I am tired of running away. You will kill me. I am old, I cannot stand much pain. Soon I will die—"

"Sooner than you bargain for, let me tell you!" said Feak, thrusting his extraordinary nose quite close to Haus.

"The sooner the better," said Haus. "I am tired of running away."

"Come, come now," said Mr. Banks. "We don't mean to be heartless or brutal. We are, after all, civilized human beings and, as my good friend Gritter would tell you, we only do our jobs. See now, Feak, he's just an old man and with a little kindness on our parts, I am sure he will be reasonable. Here, take off his bonds and give him a drink of this." He pulled a sixty-two-dollar flask from his pocket which was full of thousand franc Napoleon brandy and gave it to Feak. "Untie him. We aren't Nazis, you know."

The battered old man said nothing. He would have smiled a little if there had been anything left of his mouth. There seemed to be a strange strength in him, a thin but strong light which blazed in inverse ratio to the state of his physical being. He was on his way out. He knew it and, knowing it, was not afraid. He was the greatest intelligence officer the world had ever known.

"Thank you, Mr. Banks," said Haus. He chafed some circulation into his hands and then took the flask. He tasted the brandy and found that it was very fine.

This was not so bad. A clear, cool night. His work done. A drink of Napoleon brandy. This was not so bad.

"To victory, Mr. Banks," said Professor Haus.

"Ha, ha. To victory of course," said Banks.

The old man tilted up the flask. He poured half a pint of it down his throat without swallowing and then lowered the bottle. "So you are concerned for my papers," he said.

"Not concerned. Interested," said Banks.

"The only papers I have are those

which prove me innocent of any crime under the Nazis," said Haus.

Banks almost came out from behind his smile. Then he relaxed and laughed. "Oh come now, my dear Haus. Come now. We are not such fools. We have caught three scientists and they all confess to have sent you information. Just tell us for whom you are working and why and maybe we will forget all about the old charges."

"You'd not forget," said Haus. "No. I was a political scientist. A genius. I was the world's greatest intelligence officer. You would not forget these things. You would have me shot —"

"That's less painful than what I intend!" cried Feak.

"Hush, Feak," said Mr. Banks. "The professor is just what he says. A very great man, Feak. A man worthy of greater things. A man who very well might live to do wonders for the world."

"No, Mr. Banks," said Haus. He smiled with his eyes and upended the flask. He emptied the last half pint and lowered it again. He swallowed and felt the warmth of it crowd out the agony of his body. "No, Mr. Banks. For if I had to choose between living in service to such as you and dying in the full belief that your kind is the murderer of humanity—"

"Have a care!" screamed Feak.

But Banks was quicker. He struck backhanded and threw Haus off the chair with the violence of the blow. The empty flask thudded to the bare floor. Haus staggered up.

"I did not say I would not tell you," said Haus, unafraid.

Banks instantly regained his composure and glanced at Gritter and Feak to see if they had noticed his outburst. If they had, they did not betray it. Banks managed a smile and picked up the empty flask.

"Well, well. Quite a drinker, Haus. Quite a drinker. Would you like some more? Gritter, run down to our car and bring up a little more brandy for our friend."

Gritter went out and scouted the way before he went down the steps. He glanced at the hidden sentries, checking them, for Gritter was a very thorough man. When he came to the street he looked carefully up and down it, assumed that it was deserted and went at a bear trot down the hill toward the car.

"That's one of them," said Buckingham.

Martel drew the boy a little farther into the shadow of a doorway opposite the arch. The building was so rickety that it had been abandoned to wreckers and, led by Buckingham, they had come through the rear of it and into the doorway without exposing themselves in the street.

"He's the big stiff that went up and knocked Haus out," said Buckingham. "That was Banks you saw at the window."

Suspicion cut through Martel's thoughts. "Banks? You mean you know Banks by sight? How is this?"

Buckingham squirmed. He had so far inferred that he had been wit-

ness of all this from his present post for fear of worrying Charles.

"I . . . well. I was up on the roof and saw through a vent. That was while you were waiting in back for me to show up. After I left you . . . well, that's how it is."

"Foolish lad," said Martel. "Those people have an unlimited hunting license. They would kill anyone they thought would expose their methods, and excuse it with treason charges. Don't do that again please."

"All right, Charles. Look, here comes Gritter. See. He's stopped to talk to somebody else."

A new member of the squad had indeed come up and had earnest information to deliver. Gritter shook his head in a perplexed way and then at a rolling trot went in through the arch and up the steps and so out of sight.

"That's the man who was watching our house when I went back," said Buckingham. "He must have told Gritter that we left but he don't know how."

"Doesn't," said Martel.

"Doesn't," repeated Buckingham mechanically. "Look. That's right. They aren't going to wait for you. They're coming out."

Martel pulled Buckingham back again and together they watched Haus being dragged down the steps and into the court. Feak prodded the old man forward while Gritter stayed back with Mr. Banks.

When they had Haus on the sidewalk, the guards were pulled out of hiding and one of them went for the car.

While they waited, Feak jumped nervously about, coming in close to Haus and loudly whispering promises of what would happen to him when they reached prison.

"I said I would tell you who had my papers," said Haus a little loudly, carefully darting near-sighted glances into the street.

"Who has them then?" cried Feak.

"Brooks of Sheffield," said Haus.

"Who?" cried Feak.

"Yes," said Banks. "Who might that be?"

"A literary gentleman named Copperfield," said Haus, "who can be located in England—"

"Ah. Sheffield, England," said Banks. "You drive, Gritter."

"Brooks of Sheffield has them!" cried Haus.

"But this literary gentleman?" said Banks.

"Copperfield Fish Wharf, Sheffield, England." He gestured with his chin at Feak. "Untie my hands and let me smoke. I can tell you more. Much more."

They untied his hands and he reached into the breast pocket of his shirt and took out a cheap package of French cigarettes. He started to light one but instead threw the whole blazing pack of matches into the face of Banks. He knocked Feak sideways with a rush and raced out into the street. As he sprinted he threw the package of cigarettes from him toward where Martel hid. It seemed more than probable that Haus would get away.

But there was sitting behind the wheel of the low gray car the man called Gritter. And at the first leap

of their prey, Gritter snapped into low gear. The car sprang from the pavement and ahead under a deep spur with the throttle.

Before Martel could move or yell, the car struck Haus. The old man went spinning ahead and then the car overtook him again and passed the right front and right rear wheels over him.

Haus struggled to get up from the cobblestones but there seemed to be something wrong with his back and he could not co-ordinate his limbs. He swore in Polish and his voice had the grate of agony in it.

But Gritter had the car stopped in an instant and shifted into reverse. He surged backwards, steering with a swoop to the right. The vehicle struck the old man again and passed the left wheels over him.

Gritter leaped out, gun in hand and flopped Haus over with a yank.

The old man's arms flopped loosely out. His head rolled nervelessly to one side. Gritter stood up and pushed at him with his foot. Banks came up. His stomach was turned by the brutality and he cursed the day when necessity forced him to employ such animals as Gritter and Feak.

Gritter said, "He's dead," and holstered his gun. Banks mastered his rising anger.

"Walk down to the gendarme post," he said to Feak. "Identify yourself and have them send somebody up here for this body."

Feak was off promptly. Banks stood a little while, trying to conquer his nausea and his rage at Gritter for the senseless act.

Gritter said, "You think that was straight dope, chief?"

"Don't try to think," said Banks and the bridle came from his anger.

"What . . . what's the matter?

The deep folded eyes seared him with contempt. "I ought to fire you. What kind of stupid animal are you?"

Gritter gaped at him. "I didn't know you'd object to me hitting him with the car."

Banks shut his jaw on the torrent of abuse which sought exit. Instead, he said, "You've wiped out a trail and probably lost us papers that Jules Fabrecken—"

Gritter started in terror and looked around. "Shut up!"

Banks was instantly in full possession of himself and also looking about him. He did not pursue the conversation but created an immediate diversion by ordering everyone into the car.

Gritter guided it around the object in the gutter and the gray car sped out of sight leaving the street deserted, or nearly so.

A moment later Martel lifted his cheek from the old professor's heart. "He's still alive," he whispered in awe.

With a swift gesture he motioned to Buckingham to take Haus' feet while he himself supported the shoulders. They quickly brought Haus into the doorway they had just quitted and gently laid him in the wrecked hall.

"Get those cigarettes," said Martel.

Buckingham flicked out like a

shadow and was back in an instant, but he found Martel's powerful shoulders had already wrenched a lattice work from the arch above the door. As they laid Haus upon it, footsteps could be heard. People were already letting curiosity override their fear of authority. And from down the street a voice came, "Up in this block, gendarme."

They bore Haus through the ruined house and into the street beyond. The taxi there purred into life, snorting out charcoal fumes. Whatever the driver had arranged with himself to say at the long wait he had had, the sight of the burdened fares drove it from him.

Gently they laid little Haus on the rear seat and the taxi moved away, Martel and Buckingham kneeling before the seat to save the old man any unnecessary jars.

"Drive slowly!" said Martel.

"Yes, captain. To the hospital?"

Until that moment Martel had not fully realized the problem. He had acted on blind anger and impulse, for the sight of those boors and dolts so little respecting the great Haus, at the thought of the destruction of such a brain by the animal Gritter, a year and a half of seclusion had gone spinning away and the full hoarse yell of war thundered in his ears. To take Haus to a hospital was to condemn him to death. Not to take him certainly would.

Martel realized that disuse had cost him some of the command of himself which he had always exercised. He was trembling with anger still but his will power inexorably forced his thoughts into order. As though he reached into a dusty tunnel, he pulled from his memory dossiers.

A fantastic memory it was, Martel's. Built on a solid core of great capacity, constructed with the logic of which only a first rank scientist is capable, crammed with logarithms, calibers, formulas, faces, deeds, crimes, heroic acts, names and histories until it seemed impossible for it to hold more, it still could grasp a page at a glance and give it up five years hence verbatim. This, coupled with an imagination and intuition almost mystic and certainly seldom found, had made Martel of championship rank in any field he entered. And it brought forth now:

"Albert Franz bone specialist and physician, born 1891 of Russian father and Jewish mother, christened Velkin, practiced Vienna, et cetera, et cetera. Opposed Members of French underground in favor of Nazis on August 3, 1943 at Paris and gave six underground names, et cetera, et cetera. Residing at Villa Trieste alone—"

Martel turned to the driver. "Go two more blocks and then turn right for five blocks. Stop on the corner."

The driver did exactly as ordered. There was something about Martel's voice which made a puppet out of him.

At the corner they resumed the lattice and Martel threw a hundred franc note at the driver. "Keep the change. If you go to the police—"

"No, no, no!" said the driver.

"I am very happy that we agree,"

said Martel dryly. "Now drive away and don't look back."

Hastily the cab went away.

Dr. Albert Franz was not delighted to have visitors. War might have left him rich and passed him by forgotten—for he had covered his footsteps well—but the fear in his heart which constant vigilance fed rather than assuaged would be with him always.

He sat now at the head of a long but lonely board, served by a butler as anxious to remain anonymous as himself. And though the golden candelebra danced and the plate sparkled and the scent of recent viands still lingered spicily in the air, and though the doctor shined in flawless dinner dress, he still could start at the sound of an opened door.

"Who's there?" he demanded.

The instant appearance of a man in mufti brought Dr. Franz up from the chair.

"You may go," said the apparition to the butler.

The butler hesitated for a moment, looking searchingly at the visitor and promptly went, not even hearing the counter-command of his master.

Martel looked about the beautiful, softly lit room, at the Rubens on the wall, at the diamond stud in the doctor's shirt front. His voice was pleasant now, very companionable, and its tone seemed calculated to put the doctor at rest.

But the contents of the speech did not.

"Well, well, Dr. Velkin. I am happy to see—"

"Oh, my God!" gasped the doctor and hurriedly held a snowy linen napkin to his mouth.

"Forgive me, forgive me," said Martel. "In Paris—"

The doctor swept his chair back and stood, gripping the table, shaking, his eyes glassy above the napkin.

"I am dead," he whispered. "You will kill me."

"No, no, doctor. Not so."

"Who . . . who are you? I have money—"

"Come, doctor, we waste an inordinate amount of time. I have someone here in the hall and I think we had better take him instantly to your operating room. You have one, of course?"

"The door was locked. No one knows—"

"Lead the way to your operating room!" said Martel.

The doctor managed to stand straight. He seemed unable to command his legs. But somehow he managed to obey.

As he passed the foyer, Martel took up his share of the burden, and they followed down the corridor, across an inner court and into a detached section of the villa. Lights came on with a blinding glare and sprang back from the enamel table and basins and glittered upon steam sterilizers, respirators and cabinet knobs.

Buckingham and Martel gently laid their burden upon the operating table. Not until now had the doctor noticed and the sight made him stand straight and back off.

"He's dead."

"No he's not," said Martel. "Quickly. You have plasma—"

A cunning came into the doctor's face. "How would I get plasma?"

"If we must go into your personal history, the German black market and now the French—"

"You know that, too!" He held up his hand. "I'll get it. But this man has compound fractures, shock "

"Your hands, regardless of your past, are expert. This man must live. If he does not live, then six members of the underground—"

"Who are you? Who are you?"

"I take it he will live."

The interest of the doctor was pathetic. "But his heart action is almost gone . . . I'll do all I can! I promise. I promise on my word! But miracles—"

"You are going to make a miracle here. And remember this, that this man must not be reported to the police or seen by anyone. His presence in your house is dangerous only to a lesser extent than an item or two of your past. Let him be discovered or let him die—"

"Don't threaten. Oh please. Please. I'll do what you say. But he is old, he won't heal—"

"Use anti-reticular serum. Use estrone and testostrone. Thyroxin. Amino acids. Use penicillin. Make him live."

"But these things are impossible to get. And if they can be gotten, they cost—"

"If they can't be gotten—"

"I have them."

"And right now some adrenalin and blood plasma."

"Are you a doctor? What do you mean by estrone and testosterone? The combination— It— What theory is this?"

"His theory," said Buckingham. "Are you going to argue until this man is dead?"

"Inject them intramuscularly. The body will maintain a proper balance. Testosterone won't work all alone. It hardly works at all. And thyroxin is needed. Use ten testosterone to one estrone and three grains thyroxin per day. You will hear from me perhaps tomorrow, perhaps next year. You will keep this man here, alive and convalescing, wanting for nothing until you hear from me."

"But your name!"

"Get busy," said Martel.

Dr. Franz asked no more. He went to work.

As the plasma dripped into the veins of Professor Haus, Martel wanted to know one more thing. "Do you have a set of Dickens here?"

The doctor was distracted by the question. He despaired of saving the patient and the consequences made sweat stand stiff and cold on his forehead.

"Yes. I think there is. In the library— Why, this man's back seems to be broken!"

"Mend it," said Martel. "Come."

Buckingham followed him out. So well had Martel comported himself that Buckingham was amazed to see that, once they were alone, rage still tightened Martel's jaw.

"Charles. I think maybe we had better be getting home. They may have known it was us that took Haus. They spied on the house at dinner, you know. I . . . I'm worried about Anne."

"We'll take care of that," said Martel.

They were in the lofty library with its stained galss, Gothic windows and its hundreds upon hundreds of fine books. The walls were done in leather and depicted with hand tooling a German river scene.

"It's an ill war—" said Buckingham, quoting Martel.

They found a set of Dickens, a German set, with "Martin Chuzzlewit" and "Oliver Twist" looking extremely odd in their Gothic type.

Martel took "David Copperfield" and ran through the first few chapters until he finally discovered Davy's early visit with Mr. Murdstone to the coast.

"Brooks of Sheffield's sharp," said Martel.

"What do you mean?" said Buckingham.

"It's a passage from Dickens, and it became an English saying. Davy's foster father Murdstone takes him to the beach and cautions two men he meets not to talk in front of Davy about his mother—"

"By Jove, you know everything, Charles."

"Everything is pretty wide range. I didn't recall it well enough to do without the book, did I?"

"That's Haus' clue, then. That's what he meant. He wanted us to hear if we were by. I see it now."

"Brilliant lad—Oh. Forgive me. Buck. I didn't mean to hurt your feelings. You're smarter than Banks anyway."

"Now I'm insulted."

"Here. They went to Lowestoft for that interview."

"Copperfield Fish Wharf," said Buckingham.

"Murdstone or Lowestoft or—Give me that phone book."

For the next few minutes Martel was very puzzled. There were no alphabetical listings or anything like it for fish wharves. "Let's see—No, nothing here."

"Maybe they have no phone."

"Quinion—"

Buckingham brightened. "There's a Quinon Fish Wharf."

"Ah," said Martel. "The advantage of being an accomplished geographer. Thank you, Buck." He took out the package of cigarettes and looked at it closely. But it seemed to be just what it seemed to be.

"Come along," said Martel. "We'll get Anne just in case."

"In case of what?" said Buckingham, suddenly white. "Charles, they wouldn't touch Anne!"

Martel took him by the shoulder to steady him. "Look, Buck, you've withstood a lot of terrific knocks in your time. And you know by now that Connover Banks means business."

"But Charles! How could the War Crimes Commission—?"

"Buck, we aren't facing the War Crimes Commission any more than Kurt von Steel or Professor Haus was. There's more here than the roles the public sees. I don't know

what. But I heard a name tonight. My chips are in this pot, Buck. Are you with me?"

"Oh, Charles, anywhere with you!" said the earnest boy.

Martel looked at this diminutive Briton for a moment and then took the offered hand. They shook and in that shaking did not know that their pact concerned international empire which would reach every scientist in the world. Buckingham's memoirs dwell long upon that handshake.

Comte Faime, prefect of police at Biarritz had been and would be again a member of the underground. He was listed on the records as "le Chat a Faime" and had served hard and long in damp cellars and abandoned wells and even in city jails at the task of telling France and the rest of Europe that the days of tyranny would soon end and the world would again be free and then would stay free forever.

He threw a wicked pen, the count, a pen which was to earn him fame if not fortune as the years went on. It was he who wrote that fabulous tirade, "No War was Ever Won," and as a testimony to the versatility of genius—versatility being always suspect in anyone and giving rise to a belief in the mid twentieth century that that Fromage must have been two or three people at least -also wrote, "My Thirsty Sword".

Fromage was fond of being several people within himself, primarily because he found himself so very tame. He was born, Buckingham tells us, into a good Christian name, Corbeau, and lived with it quite peacefully to the age of seven when a despairing mother—American—who saw no genius in a small boy who licked everyone twice his size and a disappointed father who somehow never saw good country gentleman material in him, both succeeded in making life so entirely desperate for the lad that he took to his graceful heels and lived with a disreputable uncle whose creed seems to have been, "A story sold today is a wonderful drunk tomorrow," and with this sporadic tutelage nee Corbeau rose to be a journalist. From this profession he had been early sacked, for the editors could never seem to impress upon him that the primary requirement of news writing is the complete subjugation of imagination and thought and personal morals and it was obvious that the lad—then about twelve and passing for eighteen—would never be able to make himself into a sufficiently negative nonentity to report.

Starvation would have hollowed an early tomb for him if he had not chanced to sell a book of light verse —still extant but signed, "The Cynic"—and become a petted must-have at the dinner parties of the Beau Monde. Women always felt so lovely when he talked to them. But this happy existence, in turn, faded and finally was crushed to death under the heel of Le Boche.

Versatile and unthinking, he took himself into the German journalistic ranks and drank champagne with staff officers who marveled at the excellence of the young man's Ger-

man. He wrote for them. He wrote pieces about Boche tenderness and high culture which made even the censors drool. The trouble was, these pieces were so very fine, so extremely well turned, so perfectly expressed that the French people and other Boche digested lands laughed until their sides stitched and begged for more and more. The Boche did not understand this for a while, for such was the Hun thoroughness that they wanted to research the entire matter. They did. He not only went begging for more champagne but also ran with dachshunds snapping at his heels and his ex-companions crying after him to come back and inhabit a nice comfortable concentration camp.

He had called himself Thoreau under the Boche. Exactly who dubbed him "le Chat a Faime" remains unknown, but he seems to have liked the name well enough for he used it as a title, which brazeness was rewarded eventually by his present post. The government, knowing well the violence of his pen, was only too happy to get him away down in Southern France, and he had gone most willingly saying that detective stories had long been so decayed—being, after all, only the much hack-gnawed bones of Hugo and Poe—that genius should at last research the field.

In Biarritz he had done no writing. There were too many fascinating women and too much champagne there by far, and the police pay well smothered his urge to be creative in the literary sense.

Dark, dashing, brilliant and bombastic, Comte Faime cared about as much for the laws of France as he did for German philosophers, and became in a breath the sensation of the city, arresting and refusing to arrest at whim. It was a principle of his that "the introduction of an arbitrary factor in any attempt to regulate human behavior is only an invitation for innocent people to impale themselves on justice while running away from their all too clearly seen personal woes." He meant that he didn't think a state should monkey with individual reform, but should act as a sympathetic big brother and generally set an example of decency. Only in France, the most civilized country in the world, could a public official hold such a view in public. And if this had been his only sin, he could have had the post forever. But he had an additional failing: he did not think national boundaries should exist, a fact which made him dangerous indeed even in France.

Accordingly when Comte Faime, dining very late amidst much laughter and elegance—and appreciating everything only as youth can appreciate—received intelligence that an old man had been run over in the Street of the Scalded Cat, he gave the matter thought. It might be that there was a sympathy for the street born from his old underground name, but it was more likely that he didn't appreciate drivers who ran over old men.

He called for the driver and the flustered gendarme sergeant who had made the report incidentally in going off duty—had to admit that

they had made no arrest and probably would not make any.

Comte Faime threw down a breast of chicken and leaped up with the gesture of one about to draw a rapier and fight the world. "Not arrested? Not even examined! *Ma foi! Po cap de Dieu!* By the saints in Heaven and Hell underneath! Are you trying to tell me how the city should be run, *hein?*"

The old sergeant—who didn't approve of making writers into policemen even if it meant they should turn to honest work—still backed off with his mustaches whipped by the wind of Comte Faime's hands.

"But it is all regular!" he protested. "The Allied War Crimes Commission had the accident. The secretary to M. Connover Banks himself has reported it and we have sent for the body and found there is no body."

Comte Faime was silent for an instant, a fact which was very unusual. His flashing black eyes roamed the ceiling and then, "They did it?"

"Why yes. They did it, Monsieur le Prefect."

"Ah."

"You see?" said the sergeant, "It makes a difference!"

"Ah," said the ominous count.

"And there was no body at all," cried the sergeant, feeling very much his upper hand now.

"Ah," said the count. "No body."

"No body, no crime!" triumphed the old sergeant.

"No brains, no stripes!" shouted Faime and thereupon snatched up a table knife and in a trice, sure enough, there were no stripes.

Throwing down napkin and bowing to the guests he had until this moment forgotten, he called for his hat and he called for his stick and he called for his gendarmes and that was the last that house or Biarritz ever saw of him.

For the count had been a dizzying sensation for some time and he was bored with it. One can't live on the high wine of danger for years and merely set it back on the buffet to be untouched for evermore. Not when one is a writer and only twenty-eight.

The events were as rapid as his decision.

He went out to the car and was about to start for the Street of the Scalded Cat when a messenger came panting to the running board and saluted.

"M'sieu' le Prefect! There has been a murder!"

"Ah."

"A woman, M'sieu' le Prefect. Shot to death in a cottage near the Villa Verite."

"Get in! Direct us!" said the count.

"But the old man?" said the driver.

"First we go to where a body is," said the count. "The night is young. Delereaux, go to headquarters and say where I shall be. Proceed!"

The driver drove madly, an old raid siren on the running board screaming its loudest, and the town and beach fled by. With a loud yell

of brakes and protesting tires the car skidded to a halt before a small cottage and the gendarmes leaped out.

The count surveyed the scene. All the lights were on full in the house. Neighbors stood on the walk in delicious horror. There was a low gray car at the curb and two men in civilian dress lounging against it, smoking, bored. On the lawn lay a lump of something covered up with a blanket.

Expertly—for a very small amount of imagination and a large quantity of observation can make a good police officer in a year—Faime evaluated the scene and then motioned his *caporal* to pick up a corner of the blanket.

The man under it had been shot four times, all very expertly about the nose and eyes so there was not much left of his looks. His identification cards said that he was an employee of the Allied War Crimes Commission and his passport said that he was Jean Belleau of Switzerland.

The *caporal* dropped the blanket on a motion of the count's hand and they went up on the porch. Here they almost fell over another body, covered with the awning from the yard swing. The *caporal* lifted the cover and the count looked closely.

The second man had been shot three times in the face, all very neatly, and the entire back of his head was gone. He, too, was armed with Allied War Crimes Commission credentials and his passport called him Alaric and read "Germany." The count threw the papers down on the body in disgust and stalked into the house.

There he found everything tomblike. The place had people in it but no one was moving or talking. A very plump and expensive looking man was leaning against a buffet smoking an extremely fat cigar. A small, mean, clerkish sort of fellow and a big gorilla were standing watchfully on either side of a wounded person who sat, a white and savage prisoner, in a chair. There was a boy kneeling beside a chaise longue and crying dry, searing tears in heartbroken silence.

On the chaise longue lay a startlingly beautiful woman, eyes decently closed in death, a bullet wound in her breast which bled no more, her hands folded quietly as though to hide the blackening stains. She was dead and the boy cried silently.

"I am the prefect of police," said the count, not looking at the prisoner or the beautiful lady or the fat man but at a pistol which lay conspicuously in the center of the floor, almost as if it had been placed there carefully.

"Well, well, well," said the fat man. "I'm sure glad you've come, mungsoor. We've had quite a time of it here. Yes, quite a time." He came over and shook the count's unoffered hand.

"We'd have had a better one!" raged the prisoner, "if you hadn't shot me in the back!" He appeared near fainting from loss of blood, madness and grief, but there was a ring in his voice which made his

jailers cringe back from him for an instant and then grab him officiously.

"Yes, yes, quite a time," said the fat man. "My name is Banks, mungsoor. Connover Banks of the Allied War Crimes Commission. I'm a sort of political advisor to them. Small fry, ha, ha. Looks like we did some of your work for you tonight. Fortunate we came along. That fellow in the chair is a notorious criminal named Charles Martel. He's been working to free enemy prisoners for whatever they'll pay him. Oh, don't protest! We have the evidence on him all right."

Banks received no answer from the count and so bellowed along, "We came over to arrest him and found him here with his wife. She was Anne von Steel, daughter of a pro-Nazi. She corrupted him into helping the enemy but tonight when we started to question him it was she who got panicky and she started to spill the beans. Women, you know."

Still no answer, so Banks plowed on. "Charles Martel there was sitting at the desk. See, the drawer is open. He grabbed up a forty-five and shot her before she could talk and then when my men charged him, he shot both of them. Fortunately my good Gritter here managed to shoot Martel in the scuffle and as he ran out of bullets, it was all over. So, you see, we've had our hands full. But now that you're here, we can turn it over to you. And I'm sure I couldn't ask for more capable hands. Cigar, mungsoor?"

The count looked at the prisoner. "You appear to want to talk. Could you be so kind as to give me your version of the affair?"

"Why, there's no need —" but Banks was motioned to silence.

"Tell him, Charles! Tell him!" cried the boy.

Martel put his voice under control and tried to still the rage quivers in his hands.

"Monsieur le Prefect," said Martel, "that man who stands before you is Connover Banks. He has tonight committed two murders, murders without sanction of law of any kind. He is not what he pretends, but a —"

"I am sure you don't want to hear —" began Banks.

"But I do," said the count. "Please say exactly what happened."

It was training that spoke, training and self-control. But the eyes were stunned, half mad with anger and grief. "I came home with my boy about half an hour ago. My boy said he saw someone in the living room just before we reached the house and then I saw someone there too. It was a man with a drawn gun in his hand. My wife"—there was a fierce effort here—"was sitting in the chaise longue. The man supposed himself hidden behind a door.

"I came to the bottom of the steps quietly. Having no gun, I intended to enter and crush the man between the door and the wall. As I started to come up the steps one man here on the porch—he is still there—leaped up and shoved a gun at me. He made a noise, tripping on a chair.

"My wife . . . thought it was I. They must have told her they would kill me unless she told them some-

thing. She cried out to me to run, that it was a trap.

"Those were the last words my wife ever spoke, monsieur."

Martel paused and ran a hand across his face. His eyes were agony as he sought to keep from looking at his wife.

He went on. "I saw her fall. The door was open. The man on the porch grabbed me. I took his gun and killed him. Another man came out from the shrubbery just as I fired at the first. He shot me in the back. The shot knocked me down. I turned over and killed him.

"As my gun was empty I threw it at the man I had just killed and grabbed his automatic. It was a Spanish automatic. I tried to shoot Gritter as he came out of the house but it jammed. We fought a little while on the lawn and then Gritter and Feak came out and took me inside. When I regained consciousness these three men were in the room deciding what story they should tell. They called in two more and coached them on the story.

"If you want to take me and execute me for murder, monsieur, I am willing to go. I have no further reason for living."

"No, no, Charles!" cried the boy. "Monsieur, this is Charles Martel, do you hear me? This is the great Charles Martel. These men are liars and murderers! They murdered an old man at nine o'clock and then they came here and killed . . . killed our darling Anne!" Buckingham was on his knees before the count, tugging at his hand, begging, pleading.

The comte regarded the pistol in the middle of the room. He looked at Banks. He looked at Gritter and then at Feak. Finally he looked for a long while at Martel.

"Monsieur," said the comte in a sad voice, "I am afraid I shall have to take you and your son into custody. These are great villainies you seem to have done and society will be safer I am sure with you behind good iron bars."

Banks grinned broadly.

"The witnesses against you," said the comte, "are honorable men, connected with an august and worthy body. We cannot trifle with their integrity. And besides, monsieur, your story is very thin. May I ask, do you have money?"

"Money?" said Martel blankly.

"Ah, yes. Money."

"There are several thousand franks in the bottom drawer of that desk," said Martel. "I have just withdrawn my Rheims account." He gave the comte the key.

Banks grinned more broadly yet. He could understand this sort of thing. Men were always like that. Always. You could count on men and money. Always.

Faime went to the desk and withdrew the money. It was in small packets of large denominational bills. He took a swift glance at the value and found it to be about eighty thousand francs. Ten thousand francs of it he took and handed it to his *caporal*.

"You will see," said the comte, "that this unfortunate lady has an honorable burial in a decent place with a proper headstone. You will

take care of this house and its affairs and so must remain here on duty. Here are ten thousand francs. Disburse them to this cause. This is agreeable, monsieur?"

Martel nodded numbly.

"A very decent burial, you hear, *caporal?*" said the comte. "Now you, boy. Go get some good clothing for yourself and your foster-father. Two suitcases of them. I shan't want you to be uncomfortable, you know."

Buckingham managed to make himself obey and dragged himself to his feet and out of the room. They could hear him packing some things.

"Are there any keepsakes or papers you want to take with you?" said the comte to Martel.

Martel looked about him and then hid his face in his hands. Valiantly he struggled to choke down emotion and control his wits. Shakily then he gained his feet and under the watchful hunger of Feak and Gritter groped to his desk.

He opened the first drawer and put some papers in his pocket. He pulled down a small door and reached inside the cluttered cabinet to bring forth an uneven pile of notes and a string-wrapped manuscript across which was scrawled, "Negative Energy Flows: A Neglected Field with Some Notes on Potentialities in Life Creation."

He added this to his small pile and reached again into the cabinet. He stopped, raised himself and stared into the recess. His hand swept across the empty space of it and he shot back, whirling to face Banks.

"Where is the carbon copy of my manuscript?"

Banks looked at him in innocent amazement. "Why, my dear fellow—" he paused and began to simulate wrath. "You, a murderer, are now accusing me of theft? Why—!"

"Gentlemen," interposed the comte. "Please. M. Martel, you are certain there was a carbon copy? And is the manuscript important?"

"Of course I am sure. Of course there was a carbon!"

"How important is it?" insisted the comte.

The importance of existence was fading even now from Martel. His eyes rested for an instant on the chaise lounge and its tragic burden. He fumbled at the papers and the manuscript and took himself back to the chair.

"You'd best be careful of that man," said Banks. "You'll do well to keep him until he can be hung. He has been a very wily criminal for years, playing both sides."

"Until he can be hung, monsieur? But I thought you wanted him on an international charge, for espionage or assisting the enemy or some such thing?"

As he spoke Comte Faime had moved over to the desk and taken up the papers and manuscript which he carefully retained.

There was amusement in Connover Banks' voice. "Oh, that can wait. We just want justice done." And Banks looked very wise. "Yes, we are quite content. I shall tell

them in Paris how very efficient you are in this and I shall hold myself ready to appear as witness in the trial."

"Thank you very much," said the comte. "You said you were Connover Banks, did you not, monsieur?"

"Yes. That's quite right," replied Banks, glancing at his two men to see if they saw how very smart the policeman was.

"You used to head several large corporations, did you not?"

"Yes, yes indeed," said Banks. "I still keep my hand in. Dollar a year sort of thing now. Must be patriotic and attend to duty. Can't shirk one's duty just for personal gain. One owes something to his country."

"Indeed so," said the comte pleasantly. "A big oil company in particular, wasn't it? The one which had an interest in I.G. Farbenindustrie?"

Banks looked surprised, even pained. "Why that was long before the war. Long before."

"And also a steel ball bearing company in Sweden," said the comte.

"Why yes. Sweden is a great country. Terribly oppressed by the Nazis, naturally, but a great country. She was even paying off on her first war debts."

"War debts?"

"Oh, the first World War. That was quite a while ago. You are certainly on your toes, mungsoor."

"Why, one couldn't help knowing about so famous a person, my dear M. Banks."

Banks was flattered and would have said more but Buckingham came down with two bags which were taken from him by a gendarme.

"Come along," said the comte to Martel. "Thank you, M. Banks. France is grateful for what you have done tonight. France is grateful, monsieur, and I, as prefect of the police, am grateful, too. We can feel quite safe when we know how much efficiency still lives in the world. Good night, gentlemen."

Gritter and Feak stood back from Martel and watched him being taken away, watched him like hungry cats might watch the removal of a canary from their reach.

Other officials had come. The yard was tidied up. The *caporal* was phoning an undertaking parlor. Wheels went smoothly into motion.

Connover Banks came out of the house and stood watching the lights of the police car fade away up the boulevard. He was grinning as he took a sheaf of papers from inside his hundred and eighty dollar topcoat.

Feak beside him spelled out, "Negative Energy Flows: A Neglected Field with some Potentialities in Life Creation."

"Life creation!" sniffed Feak. "Who wants to do that?"

"Nobody," said Banks.

"Then why—?"

"Why then it must be negative energy," said Banks mockingly.

"Oh! What we ground out of Professor Reinhardt! What he said about Martel having worked it out and how it would—"

"My dear Feak. How brilliant

we are! How entirely brilliant we are. Go back and search the house you guttersnipe and let your thinking be done by your superiors!"

Feak went and Conover Banks stood there grinning in a certain self-satisfied way. He hummed and lit up a four dollar cigar.

Before headquarters, Comte Faime ordered his car to stop. Bidding the two gendarmes be careful with their prisoners he entered the gloomy building and was absent for some time.

Buckingham sat and wept. He had forgotten tears until now. All the misery and starvation and ill use he had received had not made him cry. But now there was something vital, precious and needed gone from his life which would never return. But as he wept he suddenly knew how Martel must feel and he looked at him and grew troubled.

Without protest or assent Charles Martel had let them put a pad on the hole in his back. Displaying neither pain nor sorrow he sat, looking straight ahead of him, examining a picture which spread only before his eyes. His jaw was tight and there were small flickers in his glance now and then which made one think of looking down into the pits of hell.

"Charles—" said Buckingham.

Martel took the boy's head against his breast and held it there, patting the shoulder quietly. There was no other movement or motion about him. He looked straight ahead, seeing things he would not have dared describe.

BANKS

The two gendarmes were patient and silent. But after a little one turned to whisper to the other. "This Charles Martel, was he not one of us?"

The other whispered back, "Of course. You have heard of him."

"There is something wrong here."

"The war," replied the other.

Martel stared before him and Buckingham gradually grew quiet.

In a little while Comte Faime came out of the building, walking

very sedately, carrying a brief case. He approached the side of the car but did not enter it.

"My children," he said to his gendarmes, "you will please enter headquarters and resume your duties. I shall drive to my home."

"The prisoner?" said one.

"There is no prisoner," said Comte Faime.

"A thousand pardons, comte, but—"

"My good friend," said the comte, "there was turf on that pistol which lay in the middle of the room. The two dead men were in improper places. The pistol would have held seven shots and seven shots were expended on those two men. From what pistol came the eighth which killed Mrs. Martel, *hein?* From whence?"

"Then," said one of the gendarmes, "those people killed the woman!"

"Ah! So we are brilliant tonight. The woman was once Anne von Steel whose father was killed by the commission. But no charge can be made against those men we met tonight. And I was afraid to leave our friend at their mercies. Now go back to duty and I shall take our friend home."

"Vive le comte!" cried the one who had first remembered about Charles Martel. "You see!" he gestured wildly at the other. "There *was* something wrong."

"Ah, I knew it also," said the other.

"Come," said the comte.

They got out and Faime slid under the wheel and quickly drove away while the two gendarmes stood on the walk solemnly congratulating each other, shaking hands the while.

Comte Faime had nothing to say until he came before his own residence where he stopped and addressed Buckingham.

"Young man, will you please enter and tell Justine my servant to pack a traveling kit for me? Tell him to be swift and come instantly that he has the necessaries. I need another suit."

Buckingham was too drained of emotion to be shocked. He went into the house.

Martel had not heard the order and paid no heed to what they were doing. He had given no slightest sign that he had heard any of Faime's explanation.

Within five minutes a small, shriveled, incredibly old, lame, withered man came gimping up to the car dragging a great bag in his left hand and a small one in his right. Under one arm he packed a portable typewriter. On his head he wore an ancient, brimless hat which had three bullet holes in it. He would not have parted with that hat for the winning ticket of the lottery.

"Thank you, Justine," said the comte. "Here are a few francs as a tip. I recall you were paid yesterday. No, not in this car. My sedan in front of us."

The old man ignored the tip and went to the big black car and stowed the bags there. He waited and then as Martel was urged toward him, helped the wounded man into the back seat and wrapped him up in a lap robe.

"It is bad?" said the ancient.

Martel looked at him for a moment. "Flesh wound."

"Ah," said the ancient. "Take this sulfa. You are not allergic to sulfa?"

Martel took it and washed it down with a glass from the complete bar which was in the back of the big car.

"And now this," said the ancient. "Sodium amatol."

"No," said Martel.

"Yes," said the ancient.

"Take it," said the comte. "I am going to take care of you, Charles Martel."

For the first time Martel seemed to see the comte. His eyes gladdened for an instant. It was as though something had broken in him or worn away in the agony and fury of the past hour and a half. He never again spoke of Anne. He displayed no sorrow. A part of him was dead. The human, kindly part. And his mind he never permitted to stray over that grave.

"Le Chat Faime?" he said.

"Aye, Charles Martel," said le Chat Faime in English. "You did not think you would find me your enemy, did you?"

"My enemy!" said Martel. "Never!"

"Your friend ever," said the comte.

"I have dangerous things to do," said Martel. "And you are an important official here."

"Life is dull. I am in debt."

"The government would retaliate," said Martel.

"Of course. You whet my appetite with danger, old friend. I, Comte Faime, the greatest writer in the world today. A police prefect? Ah, it has been very funny, Charles. Very funny. Life has been very dull since we parted at Stutzenburg in the spring of forty five. But I shall not weary you. Sleep and I will drive. Justine, here are a few more francs. A mum lip, sir."

"I am going," said the ancient.

The comte did not argue with him. There was never any use arguing with Justine.

"You were once a sailor, Justine?" asked the comte. It was a matter of form. Of course Justine had been a sailor. He had been everything. "We take a boat. I shall navigate and you shall sail."

"As you say, master."

Comte and servant put Buckingham between them in the front seat. "You have no further place to go?" said the comte.

Martel roused himself. "I must stop at Quinon Fish Wharf. You know where that is."

"Isn't that strange. I was going there myself. Tell me—" he thought about it for an instant. "That was Haus they ran over in the Street of the Scalded Cat, wasn't it?"

"Yes," said Martel.

"Two murders in one night. What is behind this, Martel?"

"Jules Fabrecken."

"Ah." The comte was silent for some time. And then he mused upon it. "Jules Fabrecken, the great steel baron of Scandanavia. And Connover Banks, the oil prince with

a fist in I.G. Farbenindustrie. What is this about, Charles?"

"We shall discover it. And when we shall discover, we shall crush it."

"I heard you speak, captain."

And le Chat Faime, alias Comte Faime, alias Henri David Thoreau, alias six dozen names by the count, late prefect of police at Biarritz, soon to be late a citizen of France, looking at the weeping boy beside him, shut his jaw tight and hurled the big car into motion.

The wind screamed and bit at the windows and the tires yelled on the curves.

But it was not that which kept Charles Martel awake.

THE HIGH ATLAS, 1947

Backed by the shattered god of ancient days, face bathed with the ruddy flames of the oil lamps, eyes alight with the passion of his plea, Charles Martel faced them.

And they, sitting daunted before the blaze of his charges, looked uncertainly at him. His clear voice still rang in their ears and while he had spoken visions had danced before them. But now fear entered them again. What he proposed was madness.

Scientists ruling the world?

Madness!

What of the huge guns, vengeful planes, battleships and armies of a hundred nations? What of the power of money, press and terror? Could these be so casually burst and swept aside?

For an instant, under the spell of that voice, they had seen themselves for what they truly were: the commanding, ruling geniuses of all mankind—the men who thought and worked in realms of thought which could not be reached by others. But now they seemed to see the flaming guns and their eyes strayed to the file cases.

Martel and le Chat a Faime had brought them, all of them, and those files included knowledge so golden about the world and men that le Chat a Faime, pacing now back and forth before the door and listening, could not see how they, these four, could possibly fail to understand.

But they were not intelligence men, those four. They did not have gifts beyond their own fields. Little Haus, alive or dead they did not know, would have cried for an aching hour to have seen their disbelief.

"Gentlemen," said le Chat a Faime, "question Martel. He will try, I know, to show you what you do not understand. His field has been wide, his journey in life has been long. We have seen things, he and I, which you do not credit for they lie so far from your spheres of activity."

They looked at le Chat a Faime. They had not known what to make of him when first he came. Charles Martel, when they had investigated his activities, they had received with enthusiasm and all good fellowship, making him free of everything and admitting him to this their closest council. But le Chat a Faime? His dossier was theirs in the files, he had aided them as prefect of police once or a dozen times before. He was no scientist, le Chat a Faime,

"And what," said Bethel, "would you call your sphere of activity?"

"This is quite off the subject," said le Chat. "I have told you before that I am a writer. Martel has told you that I wrote ten German regiments into hell. Aye, and I'll write a world of tyrants there as well if I've a reason."

"We admit you here," said Murtowsky, shaking his huge black beard, "because you are Martel's friend. But by what right can you call us to account? Martel "

"Martel is a scientist!" said Bethel. "And you, sir, are but a writer."

"Hah!" shot le Chat, striking a violent pose and slapping both hands down upon the bottom of the table. "Hah! BUT a writer. Ye Gods! *Po Caf de Dieu!* Oh, deliver me up to Banks and the dungeons! Sink me in brimstone and fry me in grease! What devil's talk is this? BUT a writer. Why" and he swept their faces with a glare— "what would any of you be doing if it weren't for writers? You, Jaeckel! Have you not your debt to Poe? Relativity? Was that not Poe? Writers! Why writers pull thought from the outer dark and deliver it into your hands. Can a peasant do without a priest? Can a scientist do without writers? On what fare does your science feed but—"

"Stop it!" said Martel. "No one here is truly mad enough to suppose that an artist does not rank with a scientist or even above him. We degenerate, I think, into a wrangle."

Jaeckel looked gratefully at Martel. "Doctor," he said, "thrusting all this aside, what you propose has a certain charm. But do we have reason to do this?"

Martel approached the filing cases which stood in green ranks. They were fabulous files. Many of them had been stolen from the abandoned offices of the German Intelligence Services. More had been recovered from where Allied troops had carelessly thrown them in the rain. Still more came from Russia, though how no man could tell. And the genius of Haus had arranged and added to them until, while those files lived, many a famous man, many a scientist, many a general and president and senator, would have slept but little if he knew of them. They contained the names, records, descriptions and addresses, amongst other things, of every major and minor scientist in the world.

He brought back to the table the master file index. It was done on India paper, one slip per scientist, and it weighed twenty-seven pounds. The ancient temple bell rang as it was dropped to the table. Martel thrust a lamp before it so that they could all see.

"Gentlemen, observe this." He indicated the section at the back. "You see here that one seventh of this file is tabbed with black. These men, scientists all," and he ruffled the thick sheafs, "have died of privation or been executed by various powers. Every slip here was a living breathing man, once, with intelligence and imagination. They are dead. And dead with them is all the good each could have done.

This many scientists," and again he ruffled the silent ranks of black tabs, row on row, "could have changed the entire state of mankind for the better. They were murdered for no other reason than that their science and some barbaric ideology did not happen to agree."

He folded a cover across the section and took the next batch marked with yellow. "This section, gentlemen, represents one twelfth of the entire file. These men are missing. They are scientists of many fields, and in those filing cases there the circumstances of their dropping from sight are set forth. Many are probably dead in bombings. Many more may have escaped and are in hiding like ourselves. But the majority of these men, gentlemen, vanished under circumstances so peculiar and so mysterious that we cannot otherwise than suppose them prisoners. Yes, many of them are of enemy color in the terms of the Allies. But gentlemen, regardless of color, creed, race or sex, they are scientists."

"Why do you make this point?" said Jaeckel. "Have we not all seen that Japanese, German, American or Russian, scientists agree. You are stressing an unnecessary point, Martel. We know full well that a scientist advanced in his own line is very likely advanced in the humanities."

"Forgive me, Jaeckel," said Martel. "I did not mean to offend."

"You did not," said Jaeckel. "I merely wanted to tell you that we are not as antagonistic as we may seem."

"Thank you," said Martel. He returned to the master file. "The remainder of these cards as you see are divided into fields and then nationalities. There are cross-reference files there in the cases which take them by countries. There are many here, gentlemen. Many. And do you suppose for a moment that when any one of the five outlaw atom projects succeed in touching off the next war, any large number of these people will survive?

"You are gathering here information, you say, gathering it so that it will not perish before the onslaught of bombs, so that the remaining remnants of mankind can build again. But what about these people, gentlemen? Are they not your brothers? Are they not striving for the same ends as ourselves? Who amongst them would be so lowly as to deliver into unscrupulous hands the keys to terror, agony and destruction if he thought for a moment that he could avoid it?

"Have you thought on what anguish the United States scientists who built the atom bomb must have felt when they knew they were guilty of mass murder never before equaled in terms of time and thoroughness?

"Dr. Carnac, amongst others, gentlemen. Dr. Carnac who engineered the design fought long within himself and was only persuaded to lend his skill to the atom bomb project originally when he and the rest were promised that a dress rehearsal would be held with enemy nations in attendance and that the bomb would never be dropped. It was dropped, gentle-

men. It was made. It was out of Carnac's hands. It did its slaughter. And have you any conception of the revulsion the American nuclear physicists felt when they knew they had been betrayed by the subsequent political tricks? Revulsion they felt, gentlemen. For can any thinking man but follow in the tracks of Nobel and Hotchkiss who each tried to end war by making it too horrible to be waged only to find unscrupulous men of little minds anxious to wage it with those very weapons? But remorse does not rebuild the cities wicked minds destroy; remorse will not cause to live again the unnumbered lives brutality cost; broken homes and shattered bodies cannot be replaced as easily as bullets and bombs can be made to fly.

"Gentlemen, if we are disinterested here, we condemn to death hundreds of millions of human beings. And we condemn to death, just as surely as though we had them here and shot them with as little ceremony as they murdered von Steel and the thousands more, these our brother scientists, working at our very problems in a hundred lands. Are we to sit idle while greed and stupidity destroy all that can make man great? Can we sit, wiped out as chalked formulas from a blackboard are erased, the best and finest brains the races of the world have yet produced? And when the universities are gone, where shall we find a way to make such brains again?

"The dark ages roll upon us like an endless storm. The Cro-Magnon and Neanderthal, retreating before the reaching ice, carried their knowledge in their legends and in the stone axes in their belts. Are we to shrug here and say 'No use' and let stone axes come again as the finest development of which man is capable?

"I plead with you, I entreat you, can you see these men die? Can you see civilization fade, falter and stop? Will you be content to sit here with your refugees and books and look out upon a charred and ruined world, a world where no medicine, no tools but the crudest, no transportation, no communication, no joy or laughter live?

"If you can contemplate the extinction of all that you have cherished, the agonies and broken bodies of the stumbling and the slain, the fallen towers of past glories and see in their place miserable ruin, if you can view the starving aged and children murdered and still remain idle and unmoved, then neither you nor I have any right to call ourselves men. Such an attitude is the lot of the brute and beast. Sitting idle, then, are we brutes and beasts?"

He was silent then and behind him the old god grinned.

There was no sound in the temple ruins but the soft padding of le Chat back and forth before the door.

Murtowsky finally spoke. "Good Dr. Martel, we have in our lives seen many wicked and atrocious things. Perhaps we did not think on them enough. Perhaps now we are dulled by the constant hammering of horrible events and scenes in the past many years. Raging demons are

loose upon the world, that we know. But, good friend, how can we do this thing? To move the mass of humanity, educate it, make it understand, is to contemplate a task for a very Atlas."

"How do you know," said le Chat suddenly, "that we have not an Atlas here?" He smiled at Martel. "But one man alone is not so many as the few of us who, snowballing into others, can constitute a very remarkable segment of the world's population. I but know my tools. You know yours. What is required here is policy, co-ordination, determination and courage. All our wits combined should make a pretty good sized dent in this little old world."

They had not thought of themselves in that way. Cloistered they had been, held away from the masses, delivering up their powers without question into the hands of unscrupulous politicians and large interests motivated by profit. They had not realized that the political and economic world was actually so dependent upon them that, if they chose, they need not surrender anything of their wealth. Listening to Martel they suddenly saw themselves as giants restrained with threads alone.

But it was Bethel who still demurred. "We cannot stoop to chicanery. You who have had a taste of evil know full well that you can force a way. Intelligence files are dangerous and violent things. I know you may in part be thinking of the power of those files for they are pretty terrible clubs. I say I know little of this, for intelligence is a sort of science in itself which only people like you and Professor Haus can fully comprehend. But I do know this: most men of science are men of principle and ethics. They well understand the theorem that living by swords is but to die by them and that no peace was ever established by fear alone. We cannot inject force into this world which already suffers enough from force."

"What is force," roared Thorpe, bursting out after much restraint, "but the ability to make the other man accept your ideas. I say use force and be damned! Fire is fought with fire!"

Martel interposed, "We are leaping ahead into policy. How this is to be done is a problem which can be reached only if we decide to wholeheartedly do it."

"But I cannot go along with any chicanery," said Bethel. "And chicanery alone could finance us in such a huge undertaking. I see very well that you intend to use those files for blackmail to gain funds and ingress—"

"You are insulting!" said Thorpe.

"Charles Martel," said Jaeckel, "is a man of honor. I would be careful, Bethel."

"Yes, Bethel," said Murtowsky unexpectedly, "be careful."

Assailed from all quarters and even by his usual compatriot Murtowsky, Bethel let out a thin scream of protest. "I do not talk idly to insult! But it is plain we would need millions and millions of pounds, fortune upon fortune to make this

project a success. Where can we get it? Where?"

A baffled silence ensued, into which Martel smiled brutally.

"Gentlemen," said Martel quietly, "it is true that we will need millions, even billions of dollars. It is equally true that if Hans had given his opinion now he would have urged counterfeiting for who could better counterfeit any currency than ourselves. But if, without Dr. Bethel's chicanery we can possess ourselves easily of these billions, will you then embark with me upon this crusade?"

They looked at him. Obviously he propounded an unsolvable problem.

"Will you embark? I say, upon an active and even belligerent program to turn aside and thwart the purposes of certain gentlemen of our acquaintance and the stupidities of the rest? If I procure these billions, will you?"

That was a safe one. Every man in the room nodded.

"I have your words?" said Martel.

"Of course," said Jaeckel.

Martel permitted the meeting to break up and at its end he slipped his arm through Jaeckel's and walked with him in close and quiet conversation out of the temple.

Le Chat watched them go. He had no idea of how Martel would solve that problem. But le Chat had faith. He made some cabalistic signs before the old god which were observed with horror by the Berber woman who had come in to put out the lamps at the meeting's end.

She screamed and went away from there and le Chat, humming a tune, the chorus of which wouldn't have been allowed even in ancient Babylon, went satisfied out into the day.

For ten days le Chat a Faime wandered about the hideaway thinking wonderful and large thoughts and instructing the ready Buckingham on the mystic arts of arithmetic and writing. Buckingham, it generally turned out, knew more arithmetic than le Chat but Buckingham was eager to go soaring through all the mathematics up to theory of equations and he accepted any interest he could get. In the matter of writing, le Chat made up for any deficiency he might have had in any other field and more. Le Chat could write anything in four languages and make it so villainously convincing or extremely moving that the very stones would weep.

Most of their intercourse consisted of discussions of subjects which they both knew all too well, for they had each been raised in the identical school of rough experience. And the gifted polish which le Chat displayed in matters of human survival brought admiration from the boy at every turn. Buckingham, though he did not know it, was fast becoming a genius in his own right. The subjects of Debouch, Stealth, Information and Plea received their improper attentions. And with them the strange bedfellows: Honor and Ethics.

So excellent had Buckingham become at these arts that at the end of two days he could tell the master-

mind that Martel had not gone to Arabia or the Moon but was still closely closeted with Jaeckel and that the announcement which they expected would be forthcoming that evening.

Speculating on this they wandered through the camp.

All was camouflaged or covered in the shafts and drifts of the ancient mine and so the brown, jagged slopes of the barren valley presented nothing unusual to the view. Hidden but very active on a peak a special radar set searched endlessly for planes and was so rigged that when it did not get the proper IFF signal from a colony ship it instantly went mad with sirens which would clear the camp and alert the guards. There were many other complicated and wonderful items about this camp, all hidden, all active, but Buckingham had discovered them all and, presenting his notes to le Chat, had pegged the use of nearly half of them.

They wandered now down to the field which appeared so carefully unused. The abandoned tents of the Luftwaffe swayed idly in the cool, refreshing mountain wind, the black crosses still visible. They were left as they were for their existence was generally known and what could better serve as hangars?

On the near side of the field a group of refugee scientists played an invented hybrid between cricket and baseball with a dash of mayhem thrown in. Their yells wafted out to be lost in the immensity of the ranges. So had been this place when Phoenicians traded, so it would probably be in a distant age. As timeless as the hills themselves was a band of sheep under the guardianship of two ragged Berber boys who let their charges scramble up a slope where they would while they, from afar, casually viewed the progress of the game.

The Berber woman whom le Chat had frightened was leading a runaway child away from the melee and as she passed the writer she looked worried and only breathed easier when she and offspring had got beyond what she considered a dangerous range. She had told her friends at the native camp that a Franzawi had come who knew the old, forbidden signs and the blond warriors and blue eyed girls had received it in awed silence. An ancient had given the solemn opinion that here was no mere Franzawi and since that time all the Berber guards and workmen had looked at le Chat with hypnotized eyes and spoke to him with the most alarmed respect. Le Chat took it all with great aplomb. He was a master of illusion, as all great writers are, and this in itself gave him much satisfaction. As a member of the only surviving cult of black and white magic—the cult of writers everywhere—le Chat was always pleased to drop a spell on anyone who happened within reach and probability, even the members of a half-wild Berber tribe. It kept him in practice for the drawing rooms where his targets were much more easily struck.

Buckingham did not know that this was also a part of his education.

He took it in through the pores. Next to Charles only stood le Chat in accomplishments spiritual and mundane. Had Buckingham known mythology he would have seen Charles as Thor and young le Chat as Loki. He dwelt in a world of giants and demigods, did Buckingham, and all was fresh and fascinating and verdant. It was the spring of his life and his blood pulsed as hot as the prose of his later memoirs. He had not yet begun to blunt his young body against the inertia of the world.

Being very important now, walking with enormous dignity and trying to get his tongue around the grandeur of his thoughts, Buckingham discoursed on future hopes.

"All this is very difficult, I know," said Buckingham, "but Charles will do what he says. Why, they treat him like a prince! Not that he doesn't deserve it, of course."

"Ah, yes," said le Chat. "So they do. He's come here as the first breath of hope to beaten men. You say though that he has changed. And yet when I first knew him he was like this. He spoke and men obeyed. He drew plans and men followed them. It is quite news to me, you see, that he was a scientist. I knew he was always extremely interested in all the scientific bric-a-brac we found lying around, but he was into so many things and did so much that he could well have rested on the accomplishments I saw. And here he was a scientist all the time."

"Charles can do anything," confided Buckingham with the air of one who imparts valuable intelligence. "The French academy paid him fifty thousand francs for a course on something—I forgot just what. And if he says he can make billions of francs, why then so he shall. But why did Dr. Bethel object and insult him. You have said that he did. But who would dare insult Charles."

"Our friend Dr. Bethel," said le Chat, "is just a little frightened of shadows. Most men, Buckingham, are hypocrites."

"Hypocrites? Why, le Chat, you are always talking about the nobility of man!"

"Man in the abstract, good comrade; man as he might be if he tried. Today you find men struggling deeper and deeper into self-made mires and clawing one another with the very fury of their despair. They know not what ails them except that they are not happy; they seem to sense that they were made to be gods on earth and they look about them and, in an effort to be god himself, each seeks to reduce all others to servility, and each who practices these is in his turn reduced. And so we have the amazing picture of all men pulling all men down."

"Not *all* men, le Chat. There is Charles, there is you."

"Ah, not all men. Pardon my conceit. But the artist, the philosopher, the gifted scientist does not forget that he is himself part god. He is a man, yes, but he has not forgotten. And he creates and seeks to show mankind that there are stars yet shining. He has a duty. He

feels it here! He does not seek to rule, he seeks but to raise others to a higher destiny. And man, the complicated brute, mistrusts the effort and makes the poet struggle through mire, sucks his blood and

kills him. And so I say men are hypocrites. They listen and pretend hope and faith until that moment when they find that by the lessons they have been taught and the tools they have been given they can themselves revert to domination.

"Thus, Buck, all men are hypocrites."

Buckingham pondered through all this and then, puzzled said, "But how does this make Bethel a hypocrite?"

"Oh, Bethel! Well, you see men cling to what they know. They do these things because it is easier to follow a pattern than it is to change. Bethel sees with some clarity into the problem. He realizes that man will never be free unless all men renounce the right to enslave others. This is plain to him. And he would change if he could. And then when the problem we have at hand confronts him he applies to it his old standards and so bends things all out of line. He cannot change. He must follow the pattern. He prates of honor and ethics and yet, Buck, I dare say our friend Bethel would be in a terrible spot if one demanded a good clear definition from him."

"Le Chat, I am drowning!"

"Forgive me. What I mean is this. Bethel tried to brand Charles with an attempt at chicanery. He cannot see how Charles can finance us without resorting to blackmail via the intelligence files. Finance to Bethel is using the currency of the very nations which Bethel would love to see destroyed. His whole world went upside down when he found out that all this encampment, all the people within it, all the food and tools purchased for it, were – and are—paid with Haus, super-undetectable currency. Counterfeit money, Buck. Haus rounded up three or four of the best counterfeiters in Europe and put them to work. The stuff has been arriving here by the bale for half a year and everyone has been accepting it and spending it with innocence. English notes, American bills, Italian lire."

"Counterfeit?"

"The counterfeiters Haus procured were the very Germans who had been making invasion money for Hitler. They had all the plates. Haus had German and Italian plates as well- the originals. He had paper by the truck load and a chemist who could make more. You saw the old warehouse at Biarritz? As prefect I took good care that Haus was not raided. Why? Because he had the nucleus of the whole solution there. But now Bethel gets nice and infects the others. They did not know and neither will the very governments—that this was counterfeit money."

"Charles would call it dishonest, wouldn't he?"

"Charles? No. Bethel, yes. Because Bethel, seeking to pull the teeth of aggressive powers yet follows the pattern within himself which dictates that he must be true and honorable. He must use only money authorized by the very governments he detests. And so I say, most men are hypocrites. They espouse a cause for good and then, if it conflicts with their life's teachings in any way, they cry shame to

it. They pretend what they are not. A revolutionary, Buck, if he be not a god, seeks only to overthrow those who oppress him so that he, in his turn, can oppress. Revolutions are not successful. They never are for men won't change their patterns. Thus Communist Russia is only a Czarist state in its bureaucratic form. Thus the French revolution only brought France a strong emperor to replace a weak one. Men don't revolt, they substitute titles and retain the old form.

"Most men, Buck, yearn for that type of government in which they can be the overlords, either personally or as a class. This is very cynical, perhaps, but yet it is true. An industrialist for instance might support a revolt to put industrialists in power but would never support one which raised up labor. 'I desire and will support,' says the revolutionary, 'the government in which I will be king.'

"All your isms, Buck, are mostly the same thing. The ideology is culled from some poet, some philosopher. The revolutionary sells the populace the catch phrases and there is a revolt and a lot of men get killed. And the new government is pretty much like the last. This is caused by two things. The inertia of the populace is such that it will persist despite all efforts in clinging to its old patterns. A few revolutionaries can be trained. But then who can train millions at a breath? And so the easiest thing to do is to give them the old government back again with a few new names. For the revolutionary may theorize at length but when he inherits the necessity to rule then he must use those weapons with which he knows the populace has been controlled in the past."

Lost, poor Buckingham could only gaze agape and say, "But le Chat, aren't we revolutionaries?" And, "Don't we seek to change the whole world?"

Le Chat smiled. "I corrupt you, I fear."

"No. Please, le Chat. Tell me. Aren't we?"

"Certainly," said le Chat, cutting at the heads of a wheatlike grass with a small stick. "Certainly, Buck."

"But le Chat! You mean we will fail? You mean we will not improve the world?"

"World saving is not much account, Buck. Saving men is. But there, you've asked for it. Charles has been beating his brains out with this same problem. Therefore it has become plain to him that we cannot use force or wage war for this will only entrench us in the old national forms again. What we can do is leave the governments be. White of us, isn't it? Leave them as they are. Touch not one senator or dictator or king, kill no single citizen anywhere. We are embarked upon a singular madness. Only destruction will make us win quickly and yet to destroy will be to destroy what we hope for. Science was not meant to kill and maim but to seek truth and help mankind. Should we then kill and maim?"

"But le Chat! What can we do?"

"Deny," said le Chat. "We can seek to deny the governments of the world weapons other than those needed to control the populaces. Armies and navies, in truth, are made for civil purposes. They are clubs over the populace. This is their first responsibility: to protect the government from its own people."

"But in the United States, they say, the government is 'by the people, for the people and of the people'. What of this? Do the army and navy in America protect the government?"

"Let us not walk on this quicksand, Buck. There are certain little tricks which are used to control. We will not go into them. In America men are free. But under any government a man is free only so long as he supports that government, believes in it, obeys it. I am cynical. You must not take what I say seriously, Buck. But some day, when we get to America, make a few small tests: preach a barbaric religion, shout 'Hooray for the Communists!', refuse to join a union and tell people all laws are enforced with fear and see how long you stay out of jail. I am cynical. Do not heed me."

"But what do you mean by 'Deny'," said the persistent Buck.

"Buck, all fancy weapons today, from the naval cannon to the atomic bomb require the continuous application of science. If all scientists simply refused to work on such destructive weapons, why then, *voila!*, there are no more wars."

"But this isn't practical!" cried Buck. "Scientists are citizens of these countries. They can be jailed and shot. I have seen them jailed and shot. And they will work when they are starving. They have done so!"

"Ah, you have a brain, Buck But, hopeless as it is, this is our only chance to keeping fifty per cent of mankind from getting squashed in the next five years."

"There must be more to this!"

"Of course. Propaganda. Strong popular feelings. Refuges for escaping scientists. There is more."

"But maybe scientists are like other people," said Buck. "Maybe they have homes"—he struggled with this for a moment, having so recently found and lost the only home he knew—"and wives and children and maybe they are respected where they are. And maybe they won't want to make a supreme sacrifice. Maybe they aren't of the opinion that there will be another war. Maybe they are afraid of their own governments and won't chance it."

"Maybe—maybe—maybe. Buck, I am glad we agree that this may well be a lost cause already. But we can try. There is something melancholy and wonderful, old comrade, in dying for a lost cause, knowing well it is already lost."

"Dying won't help anybody," said Buck.

"You are a man of experience," said le Chat. "But still, it *is* melancholy and wonderful."

"Le Chat," said Buckingham suddenly. "Do the others know all these things?"

"If they do, young man, your uncle le Chat will have done a lot of talking to them in vain."

"But Charles knows."

"Charles? Well, maybe he does. Maybe he doesn't. He has one creed, Buck. 'Damn the man that won't try!' Oh, certainly, Buck, he knows all these things. He knows more than I do. He has a dynamo in him and he can see deeper than all of us. Don't pay attention to me. Perhaps we shall win! Perhaps the world will be saved! Perhaps."

"You are sincere," said Buckingham. "You don't think it will be!"

"Buck, to me life is the grand adventure. I laugh, I drink. I wear beautiful clothes and practice magic on the ladies and lords. I am a writer. I record what I see. I inspire, I condemn, I exalt, I crush, and all with a nimble pen. But I am not of such fine blood as Charles who, well knowing where he goes, can achieve the ecstasy of the Grail. But there, here comes the week's plane!"

They stood by the hangars and watched it come in. A big Caproni bomber, converted, appearing like a usual airliner, complete with numbers. Four Italian pilots came out of the operations tent and stood idly watching the skill of their brother's landing.

Three Berbers dashed out to the ship as it came to a stop and, under the direction of a plump little Spaniard, helped run the big plane in under cover.

The pilot and his crewman leaped down and called for a ladder and when it was brought, beckoned to the idlers for further assistance.

Le Chat and Buckingham, fumbling in the sudden gloom of the hangar now that the curtains were in place, made their way to the side of the ship. They were quite unwilling to be last in any mystery and so were first into the cabin.

They encountered a richly dressed man who sought to pass them quickly and get out. This action to one of le Chat's training, was reason enough to block the way. Le Chat could see very well now. His handsome face went grim.

From nowhere le Chat flipped a compact Luger and spun it on his forefinger until it blurred and came suddenly, viciously on target.

"Well, M. Velkin," said le Chat in a voice which made Buck chill. "It seems I shall have the honor at long last"

"Don't!" The man hurriedly backed and sought to cover the muzzle with his palms. "Don't!"

"Why not? Six members of the underground received no mercy from you. Why should you cry for mercy now? What devil's errand brings you here? For know now that you are recognized, that your past is clear in my mind as it must be black in yours and that you are going to die, here and now, painfully!"

At this speech Dr. Albert Franz, once Velkin, shuddered and fixed a glassy eye on Heaven via the bomber roof. "Save me! Jesus save me!"

"Le Chat a Faime!" cried someone on the floor. "Put down that

gun, you beloved fool and come here to your old friend!"

Le Chat thought he heard ghosts. Uncertainly he took a forward step and then dropped hysterically on his knees beside the basket stretcher.

"Haus!" he cried. "Haus! Oh, you sinful, wicked brute! You filthy degenerate beauty! You sweetheart! Buck! It's Haus! Somebody phone Martel! Somebody, anybody! Oh, Haus, you ugly duck, you charmer!"

"Don't!" wailed Haus. "*Gott*, you swiner! Can't you see I am in baskets and casts? Don't maul me! Help!"

Indeed, now that le Chat got a good look at him, Haus was in a remarkable state. The wire stretcher exactly enclosed him as an outer layer. Then there were bandages. And plaster. He looked like nothing less than a mummy fitted with a gigantic mustache and fishbowl thick glasses. He wreaked of iodoform.

"Do be careful," pleaded Velkin. "Oh please be careful of him. He is a mass of broken bones."

"You better worry about me!" said Haus. "Le Chat, this stinker has done an heroic thing. Und ve should forgive him—keeping him under guard of course. A genius the bones mit. And he has fortune and home deserted all for the love of Martel—and some persuasion from me of course. And here we are. *Ach*, how lovely it is to see your face. Still hungry?"

"Somebody take this stretcher!" said le Chat.

"Oh, do be careful!" wept Velkin.

And they bore Haus across the field and up the hill in triumph, greetings beating upon him from every side. After him came a regular safari of supplies by which Velkin intended to make the professor well beyond doubt.

A Berber, dirty and thin, looking uncommonly common, watched the procession disappear into one of the drifts which led to quarters and then, with an intelligent and wary eye, looked around him.

He hefted his rifle and shouldered the strap and then, walking casually as though he had no errand in the world beyond drumming up a few lost sheep, went down the hill.

Ahead of him, thin in the afternoon haze, stretched the far-off coastal plain.

Le Chat a Faime stopped at the laboratory entrance and looked with something like awe into the huge underground cavern. Switches gleamed sullenly, great banks of transformers stood like squat ebony giants, porcelain insulators winked, and scattered coils of wire, mounds of condensers, piles of tubes, cabinets of intricate connections jammed the place until, for all its immensity, one could scarcely walk for fear of stumbling into sudden oblivion. The whole was bathed in eerie blue light from vapor lamps and there was a devil's smell of brimstone in the air which caught and twisted the throat. But lowering down upon it all, its head utterly out of sight in the ink of the far off roof, muttering and snarling and crackling as

though brooding mad, stood the god of the place, a vibratron.

Men, goggled and aproned and gauntleted until they were better thought of as earth gnomes, were busy in the place, dwarfs before power.

Far off in the distance splashed red was another man, Martel. He stood before a bank of furnaces which roared and sighed and roared again under the onslaught of forced-fed fuel and air, developing incredible temperatures and throwing out an angry scarlet glow which flickered and flashed upon their master and painted fantastic patterns upon the concrete floor.

Jaeckel was there in attendance, like a magician's familiar, handing, advising, warning and often recoiling.

Their activity smacked of the blackest black magic to le Chat a Faime. Here was a realm of mystery into which he could not reach. Here were rituals and cabalistic formulae which would be forever closed to him. Here and here alone he felt awe.

He had liked and respected Martel before.

Now he looked on him as some kind of exalted priest whose mysteries could never reach the brain of a common man.

The shrill whine which filtered through this bustle and roar began to eat on le Chat a Faime's nerves. He was afraid to enter and yet as he nervously glanced at his watch he saw that Martel and Jaeckel were already ten minutes late for the meeting. He disliked going back and telling the others that he did not know when they would come.

A youth, sweating, withdrawing his gauntlets and goggles to wipe at his forehead, breathed deeply of the cool shaft air and then noticed le Chat.

"Would you take a message to Martel for me?" said le Chat.

"Bother Charles Martel?" plainly the technician was shocked. He looked as if someone had just asked him to soar to the moon unaided.

"He's late for the meeting," insisted le Chat.

The youth knew nothing about the meeting. Since he had deserted the Russian army in Vienna and thus given up a promising career as an electrical engineer this had been his home and Jaeckel had been his general. In the past ten days he had seen his general clicking his heels respectfully to Charles Martel and had himself seen that there were things here which had gone right the first time to the pressure of Martel's thumb.

"No," said the youth.

He went away from there. Le Chat a Faime fidgeted. He wished he knew where that accursed whine came from. He looked at the transformers and switches, electrodes and condensers. He shuddered.

Martel had a long pole now and Jaeckel was waltzing at a distance. They were obviously doing something which was intense and important.

To themselves Martel and Jaeckel might have appeared as practical and even normal individuals, but to themselves so might have appeared

the greatest Chaldean astronomers thinking naught upon the respect, even reverence, which they inspired in the breasts of those confronting their great mysteries.

Le Chat a Faime would no more have moved from that spot now to address or disturb these two supernatural beings than he would have thought of swimming in a lake of lava. There was something so eerie in their flame-painted bodies, something so awesome and godlike in their command of these immense powers and mechanical beasts, that they removed from themselves from any association with ordinary mortals and walked now in some far realm where no mere mortal dared touch a terrified foot.

He looked into the kingdom of the underearth and found Vulcan and Loki conniving there with magical forces and tools and very much preferred to hide his time.

He sought to whistle to declare his extreme casualness and the whistle became all wound up in jagged harmonics with the shrill whine and wound a curving rasp of sound down through the enormous chamber. Instantly he ceased as though he had been caught singing a juke box song in church. A silly grin upon his mouth he backed up until he was outside the entrance in the cold starlight.

It was a greater relief than he had calculated and the effect was to start the sweat from his brow where it stayed like a clammy hand until his handkerchief swept it away.

He was very glad to see something understandable like Haus borne on a stretcher by two Berbers enroute to the temple for the meeting. The Berbers were not enjoying life for even though Haus had slept since his arrival his many contusions still ached and he was informing the Berbers at each jolt of divers biological monstrosities which had offensively existed in the ancestry of each. He was varying the languages he used through a gamut of the twelve he knew in case the Berbers might fail to understand completely their extreme accursedness in one or another tongue.

"Stop!" cried Haus at last. "*Ach*, the camels which have suffered, the beasts which have screamed, the dogs— Ah! Le Chat!"

"Hello, Haus," said le Chat, finding that his voice quivered a little as he sought to use it. He repaired that. "Martel and Jaeckel are going to be late, I guess. Working." And he jerked thumb at the cavern.

"Go in und tell them to come," said Haus. "Work, work, work. It's all a scientist thinks about. And here we hold a world—so!" he pinched thumb to forefinger, "and they play with their toys. Zo! Go in."

"Maybe they would rather not be bothered."

"*Ach!* Maybe I would rather not be bothered. Go in and tell them. Say that Haus is waiting here in the cold. They'll come." He looked hard at le Chat when that one hesitated and the starlight made the thick lenses glint.

Le Chat twisted around and tried to get nimble with excuses. But the

starlight on the glasses was so like the eyes of his long dead tyrant of an uncle and so unsettled was his mental condition that he finally squirmed backwards until he was within the entrance.

Beaten, le Chat turned, summoned up enough nerve to face six firing squads, and plunged.

He hoped his steps were sedate for his knees were certainly not. The dynamo was shrilling at a higher pitch. The squat ebon beasts of transformers glared upon him. The furnace mouths yawned and gulped hungrily while tubes, like wolves' eyes, regarded him balefully in the dim niches. Bric a-brac lay about, shadowy and indeterminate, like wounded robots. And glaring upon him from its unseen heights, the god of the place, the vibratron, bade him turn and flee with a silence as thick about it as a wall.

Le Chat would have obeyed, but he had his eyes steadily on Martel now and he repeated mentally that Martel was an ordinary man and his friend and would be quite pleased to see him. After all hadn't he and Martel drunk from the same pannikin? Hadn't they shared many a damp and questionable shelter. Things like this draw men together and did any of this wipe out those shattering years of comradeship which in their very destruction cemented friendship true?

So saying he made bold to progress until he was quite near the vibratron. He glanced at it with the hackle-raising sensation that it was alive and possessed of diabolical cadism, waiting only until an unsuspecting victim was within reach of the altar base when it would energize and, reaching an insensate arm from the blackness above, take its human prey. So strong was this sensation that before he could entirely grip the wild flight of his intuition, he had half begun an ancient and magical sign, one hand on his gun.

He instantly restrained himself. The "god" was after all a thing of Martel's building. He had heard something of that. It had been something usual, used in splitting matter or some such thing—le Chat did not entirely understand—and then Martel had shielded it and rebuilt it for purposes of his own. Well, Martel had built it and Martel was his friend. This "god" was so much porcelain, copper and bismuth. It rated no cabalistic signs.

He was passing very close to it now and, with need of a gesture of contempt, instead he gave it a patronizing slap.

The effect was instantaneous and awful.

He had felt a tugging at his pocket and now, with a jarring rip, the cloth tore and his gun flew from him like something terrified of its life!

So hard was the yank that it unbalanced him and threw him away from the vibratron on the same course, naturally, that the gun had taken. He staggered, kept upright only by letting one knee touch earth, and holding his left arm up in defense, gazed past it in horror.

The god of the place regarded

him with impassiveness as though no longer interested in him, having proved superiority and authority here beyond any mortal doubt.

In a few seconds, le Chat's heart went low enough in his throat to permit him to breathe and he glanced about hastily to see if anyone had noticed. No one had and so le Chat, like a good soldier, fumbled for his gun.

It lay upon the ground some twenty feet from the vibratron, directly below a large and intricate converter which had been operated upon and now had its metal guts dangling from it in a tangled copper stream.

Le Chat went up to the gun and fumbled to grasp it.

But the instant he touched it, it moved!

Experimentally he sought again to touch it. It inched farther away from the vibratron as though it, too, was terrified of the thing and sought to bury into the converter's abandoned guts and hide.

Le Chat tried just once more. He lifted the copper wires and reached for the weapon but instantly that it was free and before his hand could touch it it flew anew and vanished utterly in the flame-splashed gloom.

This was too much for le Chat. The courage of this very courageous man went out like a candle blown.

He whirled and raced for the exit and he didn't stop running until he was all the way outside and some ten feet beyond the stretcher where Haus lay.

Somehow he managed to halt and despite the proximity of that great yawning hole in the mountainside beyond which guns flew away at a touch and dynamos roared, braced himself to come, sweating and watchful, back. He experienced a great desire to be gone a long way from that spot and, in truth, he ever afterwards avoided its vicinity.

"Ach! Vere iss Martel?" said Haus, thinking plainly that something must have blown up in there.

"He is all right. He'll come right along. We're to go to the meeting right now."

"What happened?" said the agitated Haus.

"Oh," said le Chat, with a forced and very shaky laugh, "I just run like that sometimes. Good for you, you know. Healthy. Yes indeed. Very healthy." And when he tried to laugh again he found that the sound threatened to go soaring from baritone right on up to mezz-soprano and hastily desisted. "Come," he begged.

And the very curious and also suspicious Haus permitted himself to be carried in the tracks of le Chat who hadn't waited around to see if his suggestion would be carried out but was now, with all decent haste, approaching the ancient temple where sat a god with a shattered face who, though he might have gobbled a few human sacrifices in his time, was yet a god a man could understand and hold in control with a few expert, mystic and beautifully executed signs.

It was a hot, sweating, much disheveled Martel who entered the meeting place that night. It was

late and the other members of the group were greatly annoyed. Nine o'clock was not midnight. But out of respect for Martel they held their peace and waited for him to take his place at the head of the board.

Presently the endless cups of coffee had given up their remains from the board and Murtowsky had put away his huge brass samovar and all squared themselves about to listen to the promised tidings.

Like most people they had their illusions about what a top-flight nuclear physicist should look like and they were vaguely troubled by Martel. He should have been wearing comfortable but somehow dignified mufti and his face should have been shaven and somewhat haloed by the brilliance of his knowledge. He wasn't and it wasn't.

Charles Martel stood there in the dirtiest, most tattered apron conceivable. Where the rubber was ripped, rusty pieces of metal thrust out, and great gleaming globules of cooled splashes mingled with the soot and dirt of the furnaces. His arms were bare and stained to the elbow, pitted with new burns; his hair was all matted and bedraggled under a much chipped helmet; his forehead was greasy and brimy and covered with an old pair of goggles which only a spiritualist could have seen through. Hands, cheeks, boots and pants all bore the signs of wear, grime, travail and antiquity. Charles Martel neither looked nor smelled like a top-flight physicist. Bethel wrinkled up his delicate nose. He had ideas about people looking their station and certainly tried to live up to them—that he was scrawny and unprepossessing was a thing which never entered his calculations.

The last time Martel had stood there they had heard themselves fried alive for their inactivity. And as he had had no word for them prior to this eleventh hour, they regarded him mixedly.

Murtowsky knew he had failed.

Thorpe was an agony of curiosity and hope.

Bethel knew Martel had been bluffing all along. But old Jaeckel held his peace and le Chat and Haus ran on pure faith alone.

It was Thorpe who spoke first. "I hope we are not assembled here in vain, Martel. If you've got anything like you promised, we can quit this fiddle-faddle and get in some real licks against those—"

"Let him talk!" said Haus. He was raised on two stone seats but he couldn't raise his head from the stretcher and he couldn't sit at the board. He made it up by sending veritable gamma rays out of his glasses.

"If he has anything to say," said Bethel.

"He has!" said Jaeckel. "Tell them, Charles!"

Martel had been trying to get out of his apron for the thing was heavy and stank, but he gave it up, not being able to reach the huge buckles in the back. He paused, dropped his hands and looked at them.

"Gentlemen," said Martel, "some time ago at a meeting here I promised you that I might have some

solution to our difficulties. For, if I understand things correctly, we are almost entirely without legitimate finance."

"Yes!" said Bethel.

"Aye!" growled Thorpe.

"There seems to have been some taint of criminality concerned in the methods which were formerly employed, according to some of us, here."

"Vy nodt!" cried Haus. "If we manufacture bills and nobody can tell it, vy nodt do it! *Ach*, such queasy bellies!"

"People can tell it! A bank in Rome told it and arrested an agent!" said Bethel. "And besides, it is not a moral thing to do. We can put just so many bills in circulation and then people will get curious."

"Let him talk!" howled Haus.

"As I was saying," pursued Martel with a smile, "we seem to have had some slight difficulty with money. This is not entirely uncommon amongst the scientific brethren and, I dare say, might even be found amid other classes of people. I seem to recall at one time or another that people have said this or that about needing money."

Thorpe laughed.

"Tell us quickly!" said Bethel.

"All right," said Martel. "I'll tell you quickly.

"During the past few years I have been working on a certain theory concerning the contacting and utilization of a certain hitherto unexploited source of power. In Biarritz, gentlemen, I was able to do some quiet research on the matter and had certain hopes regarding it. But I was not able to apply the final proof for lack of adequate facilities.

"Facilities, gentlemen, are just as important as the idea. Through the brilliance of our compatriot Jaeckel, we are possessed of some marvelous equipment. His genius converted a cyclotron to a needed machine, a vibratron. He even had to make porcelain to accomplish this and to draw out and wind all his own wire. He and his staff worked for days and nights without sleep until this was done.

"Then one of our Russian technicians was able to convert the furnaces and permit them to be used for these specialized processes under Jaeckel's direction.

"Further, an Englishman we have here made transformers of the proper pattern and a young Irishman and a Swiss together accomplished the construction of intricate and appallingly delicate instruments needed to measure various flows.

"When Jaeckel and his co-workers had done this—"

"On Martel's drawings and ideas!" interjected Jaeckel.

"When he had done this," said Martel, "we commenced our first tests. I had not accurately measured the potentialities contained in this new power and, I am ashamed to say, five days ago, gentlemen, the Atlas Mountains and perhaps a large chunk of North Africa almost ceased to exist with us along with it."

Murtowsky got a gloomy satisfaction out of this and smiled. But the others were rather alarmed and glanced over their shoulders as

though they could see the laboratory and the mountains bursting apart.

"We were using an atom pile for power," continued Martel, "and we did not know how violently our energy and fission disagree. Jaeckel saved the moment by getting the pile out of there and shutting off the new source.

"It was not until then that it came over us that we were experimenting with something quite beyond our original intentions. We must return to those experiments shortly in order to assure safety in the continued use of this power."

"What were the results!" cried Thorpe tensely.

MARTEL

A single small object, about the size of a marble came out of Martel's pocket and was tossed belligently upon the marble table. It lay there, seven pairs of eyes intent upon it, seeking its mystery.

Bethel let out his breath in a sigh. He did not know what he had looked for but this innocent little ball was so unimpressive after the tremendous build up it had been given that he was sharply disappointed.

"That?" cried Thorpe.

"I knew it couldn't be much," said Murtowsky, idly pulling the small ball to him. No word of disagreement was given and he pulled the object near a lamp and looked closely at it. He started to put it down and then with a hasty jerk brought it close to his eyes.

"GOLD!" he shouted.

Bethel had it out of his hands in an instant and into his own mouth. He bit it. Tooth prints were left on it.

"Gold," he whispered in quiet awe. His fingers wrapped convulsively about it.

"Let me see it!" cried Thorpe and, with some difficulty, got it away from Bethel.

It was gold and Thorpe, one of

the world's foremost authorities on all things economic, looked wonderingly and then suspiciously at Martel. Thorpe had a certain respect for gold—perhaps because he knew how many wars had been fought, how many souls bartered, how many lives sacrificed to the element. Gold was a mixture of mathematics, cupidity and blood to him.

"It's gold," said Martel quietly.

"Mine it?" said Thorpe.

"Made it," said Martel.

"These mines about here," continued Martel, "once did contain gold, with silver. But far and away the most prevalent metal was lead. They took out their gold, they did something with their silver. They left their lead in vast quantities wasted in the slag as too heavy and too costly to transport out of these rugged mountains. But the gold that was here was spent by Nero or a pope a long, long time ago."

"What are you trying to tell me?" said Thorpe. "Man, the Philosopher Stone has been the dream —"

"Like a lot of casual inspectors," said Martel, "we have all made errors about philosophers' stones. People who wrote about them had certain hopes. But there is a piece of gold."

"Real gold!" said Jaeckel. And like some physics professor he hauled out of the store he had brought a graduated beaker and a balance.

Jaeckel showed them the gold, showed them its volume in the beaker, put it on the balance and showed them its weight. With a big piece of chalk he wrote the calculation on the marble table.

"Gold," said Jaeckel, showing them the density.

From his store he took a small chromium anvil and a hammer. The hammer batted away at the chunk and then it prevailed. The metal became of an incredible thinness and a long tape of it began to inch away from the anvil like a Christmas ribbon.

"Gold!" said Jaeckel.

He pounded one piece very thin and held it up to the light. Bethel grabbed it from him and stared. It was green when translucent.

"GOLD!" said Bethel. And he ripped a piece of the thin tape off and curled it up like foil. When the tape had passed on, Bethel's eyes stayed riveted upon the little ball in his hand. He was excited and pale. But suddenly a great suspicion came over him.

"You made this, you say," said Bethel.

"Yes," said Martel.

"Out of what? Out of gold?"

"Out of lead," said Martel.

"How can this be?"

Martel paused in the act of answering and realized that he had better not fly too far with his technicalities and theories. He sought to reduce it all down and though this was quite impossible he still tried.

"Lead is almost as high on the scale as gold," said Martel. "The slight difference is the number of electrons and the size of the nucleus. All one has to do is increase . . . well, the nucleus has to need more

electrons and so all one has to do is increase its potential and then add the necessary electrons."

Bethel struggled with this, suspecting its simplicity. "How do you mean 'Increase its potential?' I am no physicist, Martel, but I still know that God made things as they are and you are influencing matter in some way which is not exactly . . . well, material."

"It's not material," said Martel blandly. "It's force. But it's the kind of force you get from rubbing glass. You see, we know all about amber-type energy but we don't know anything about its cousin. We call the amber type 'electricity' and we use it to run motors and light lights. It has a certain magnetism connected with it and the flow of electrons and magnetism—"

"I don't understand," said Bethel.

"Nor I," said Murtowsky.

Le Chat held his peace. Of all those present he knew, down to the deepest recesses of his soul, that he understood the very smallest least. He was nervous with the talk.

"Well, there are two types of flows," said Martel. "There is electron flow and then there is another. Well, this other is the type with which we are working. Magnetism is more closely allied to it and—To be frank, it is very difficult to state this so that it can be understood. There is much more to it than this.

"I first conceived of its existence by watching a tree. The tree has leaves and I knew these were there to take chlorophyl from the sun. But why were leaves so like airfoils? They rustled in the wind. Why? And eventually I understood that this movement released a certain energy into the tree. I tried to measure it but no known means sufficed.

"Finally I cut the 'nerves' and tried to get at their potentials, but the nerves I cut no longer transmitted. It was not until I found that there was a tiny repulsion there to iron that I had a clue. At last I recalled an old superstition. If one drives a copper spike into a tree, it will die. I tried it and it works. Obviously copper must do something to this flow. Finally I engaged with bismuth and oxygen in a meter to measure the potentiality. It was very great.

"Then I thought of human skin, for a person goes to sleep when air is not moving across some portion of his skin. And I brought my meter near my boy Buckingham and was astonished that it went mad.

"We have long sought to measure brain waves. Only a tiny portion of the energy consists of what we call electricity. It became obvious to me that I was dealing with a stronger force, closely allied to life and certainly very near the problems of magnetism and gravity. I found eventually that I had a central force, one, which was also three forces not hitherto measured.

"Consequent experimentation and calculation demonstrated that I was also playing with the thing which held the atom together and that I could impart it at will to particles of matter which were, in essence,

force of one kind sitting in a solid force of another. Transverse and lateral wave experiments permitted me to inspect this more closely and even to drain it off and use it. I could make elements apparently disappear if they were low enough on the scale and I could change the quality of the higher end.

"We have been playing with the lower, less important part of the problem with our fission which is, after all, destruction and man is very good at that."

"I am still at sea," said Thorpe, "but I understand that you are up against *elan vital* of Bergson."

"Not exactly that," said Martel. "For it isn't just one force. It is a series of forces, three basic, one really, which embrace in ratio to their motions different qualities. It is motion."

"Of what?" said Bethel tensely.

Haus laughed at him. "Motion! *Ach,* Bethel, always on the track of God you are. You let God alone. Plenty of mystery yet there is beyond this, I bet."

"Correct," said Martel. "Plenty of mystery yet. All we have really done is tap a source which wasn't before tapped. Where it goes, what it does we do not know. We have barely enough data to use it. And use it we can. Because it comes from glass and because it is bound up with life, I've called it 'viticity' for it is not electricity any more than a cop's whistle is a steam engine."

"It is, sort of," said the very practical Bethel. He went back to handling his chunk of foil and as he regarded it something came over him and he thrust it away. He bent a very accusing glance on Martel.

"You came here to solve our money problems, not lecture on physics," said Bethel. "There isn't enough gold in that chunk to buy a sack of wheat. It is no more than an idea!"

"Hah!" cried Haus. "More gold he vants! Gold, gold, gold, eh, Bethel?"

"We have had some difficulty with mass production," said Martel "and it is upon this that we have been working."

"Then the problem isn't solved at all," said Bethel. "You just have a part of a solution. We need gold. We need great big chunks of it. If we are to rescue our fellow scientists from the world, to build up a propaganda machine, we must have lots of it. Pounds, even thousands of pounds of it. And where are we going to get that?"

Bethel stopped and sat back. He was proud of the sticker he had advanced. He hadn't been able to understand a single word of Martel's explanation and the thought of it so outraged him that now he was going to get even with interest.

"Well," hesitated Martel, "there have been some difficulties—"

"Ah, yes," groaned Murtowsky. "Difficulties are always to be found. Always. We must have more than this, I think."

"How much more?" cried Jaeckel.

"Oh," said Murtowsky. "Enough to do what we want. A thousand pounds of it anyway to start."

"Yes, a quarter of a million dollars would start us," said Thorpe. "But if there's difficulty . . . well—" he sagged.

"I am sorry, gentlemen!" said Martel.

"Sorry!" cried Haus. "To you pigs the greatest scientific discovery of the age he announces. And he has to say he is sorry. Has gold anybody else made, *ja?* Has der energy anybody else discovered, *ja? NEIN!* And he apologizes. By *gott,* if I injured vasn't I vould wipe mine feet on your—"

"Our interests are practical, not scientific!" said Bethel. "We need gold and lots of it! Lots of it!"

"Then," said Martel, quietly, "I had better send them away."

"Who?" said Bethel.

"The men at the door," said Martel. "With the gold."

But he didn't need to speak more. Everybody turned and gaped and the men who had been waiting there all this time as a sort of gigantic practical joke, came filing into the chamber.

Each one was struggling to push along a wheelbarrow. And in each wheelbarrow there were great gleaming ingots of gold so that the iron wheels groaned and protested.

The line came in and each wheelbarrow dumped its burden with a thud which shook the ancient building. Then the man went away in the line and passed the incoming burdens.

The pile of ingots grew. The thuds multiplied. The shining pile shuddered and thumped and ingots slid carelessly off other ingots and the base widened and the height raised and under the flame of the oil lamps the precious yellow metal gleamed and glittered.

"That will be all," said Martel to the foreman. "You needn't go back for the second and third loads."

He was about to rub it in a little by asking Bethel how much he could buy with that.

But he didn't have the heart.

Bethel and all the rest save Jaeckel were like men stunned.

In a voice which was almost a prayer, Bethel whispered:

"Gold."

PARIS

Many hundreds of miles from there, in a Paris which was managing somehow to forget the rigors of (1) German occupation and (2) American soldiers on furlough, old General Dupre, chief of the Deuxieme Bureau, was dusting off a chair with a fine flowing bandana and giving welcome to a M. Goddart, a severely formal gentleman.

Old General Dupre bustled around, snapped some sharp orders, let me tell you, to his orderlies and flunkies and other spineless people known as clerks and army officers, and raised a rather sizable cloud of official dust. This show done he sat down, mopped a very red face with that very red bandana, puffed hard through a white walrus mustache and finally, after commenting acidly upon the awful way he was served, let the curtain fall on his own show and invited M. Goddart to raise his.

M. Goddart was rather coy about

it. The Deuxieme Bureau would seem to have been a place to invite confidence for it was, after all, the very sanctum sanctorum and inner portion thereof of the most secret and closely guarded information of the French government, being the fount of wisdom known as the Intelligence Bureau. But M. Goddart saw fit to peer under doors and chairs and behind lamps anyway.

In the face of this fearful secrecy old Dupre got himself into a complimenting state of worry and concern.

This was the first curtain of the first act of M. Goddart. The last curtain was scheduled to fall on a certain mountain of the High Atlas.

"I have information," said M. Goddart, "that the safety of the Republic is at stake!"

Most people who came there had some such tidings and most people were shunted to a clerk and forgotten about. But M. Goddart was, at once, the director of the *Banque Francais* and the very man who had suggested General Dupre for the post of Intelligence entreprenur for the realm. M. Goddart got a certain amount of attention in that office—or in any branch of the government for that matter.

"From sources," said Goddart, "which are unimpeachable"—Jules Fabrecken—"it has come violently"—Jules Fabrecken—"to my attention"—Jules Fabrecken—"that the safety of the republic is threatened"—especially Jules Fabrecken's—"by certain zealots"—not friends of Jules Fabrecken—"who are engaged in the manufacture"— to no profit for Jules Fabrecken—"of an atomic bomb"—which lacks the sanction of Fabrecken—"with which they intend to blast France"—and also Jules Fabrecken—"and it is of the most urgent necessity"—Jules Fabrecken's—"to eradicate these fiends," before they eradicate Jules Fabrecken.

Now old General Dupre was not good at reading between the lines. He was at best a faithful soldier and as such rather given to supporting not so much the theory of the government he served—for military service under any ideology is the same fascism—but to maintain the *status quo*. Further, ever since Mimi had finally surrendered, Paris had a certain charm for him and he disliked the disturbance of another war just then, for he knew very well that he would never be advanced any place else anyway and was very lucky in his present post. Therefore he received this intelligence with something more than professional horror. He actually felt sick. For the director of the *Banque Francais* was an infinitely respectable man.

If his pencil had not been present he would have drawn the sword on the wall. "Details!" he barked.

"Several scientists of the poorer sort—liberals—are inciting the Berbers in the High Atlas to revolt. Knowing that France is nearly prostrate, these Berbers have armed themselves with German and Allied equipment discarded in the wake of war and are themselves about to revolt and turn all Morocco, Algeria and Tunisia into a shambles.

"This information came through . . . well, our own intelligence sources. I have here the exact location of this group's headquarters. The various things needed for manufacturing an atom bomb are all there and the work is going ahead.

"They intend to bomb Paris and other principal cities and then while everything is disorganized to seize control with a police force of Berbers and Moors and so fasten upon the state. Their work is well advanced and there is little time to lose."

He gave Dupre the paper.

Dupre looked at it. He went to a chart which bore all the French colonial possessions and made a mark on the spot. He came back and sat down, very businesslike.

"What numbers are assembled, actually under arms?"

"Nineteen hundred," said Goddart. "A guard of two hundred and fifty only are at the actual site. The others are scattered in the vicinity."

"What usual equipment do they have?"

"Four fighter planes of the Italian type, six Caproni bombers. No artillery. No cavalry."

"Fortifications?"

"None. But they have an air-raid warning system and it would not be advisable to scout the position prior to attack."

Old General Dupre had known M. Goddart for some little time. He had not been entirely impressed before with Goddart's military sense. But it was remarkable how that had improved suddenly.

"The pass is guarded?"

"Yes," said Goddart. "But the superstitious Berbers do not watch at night. They eat about four in the afternoon and sometimes do not replace their pass guards."

Dupre was delighted. "Ah, you would have made a great soldier, M. Goddart. A very great soldier! And all this is perfectly reliable of course."

"Of course."

"No offense. Well, there! That's all I need." Dupre grabbed the phone off its cradle and three scared staff captains bounced into sight, standing like three automatons before their altar, the desk.

Dupre sent them in three different directions instantly. He spat and growled into the phone. Finally he had the highest he needed on the phone and rapidly advised him. He nodded and jerked at the invisible speaker and then hung up. Dupre was all business. When two colonels came into the room he lashed at them with a verbal saber:

"Proceed to Morocco. Take these notes. Make the attack with Chasseurs and a mountain battery. Bring back all white men prisoners. Destroy all equipment on the sight and disperse the Berbers. Any questions?"

The colonels were junior and senior, of course. The junior looked to the senior and the senior looked at his god.

"None," said the senior colonel.

"Dismiss!" barked the general.

Dupre was rather bewildered by the whirlwind.

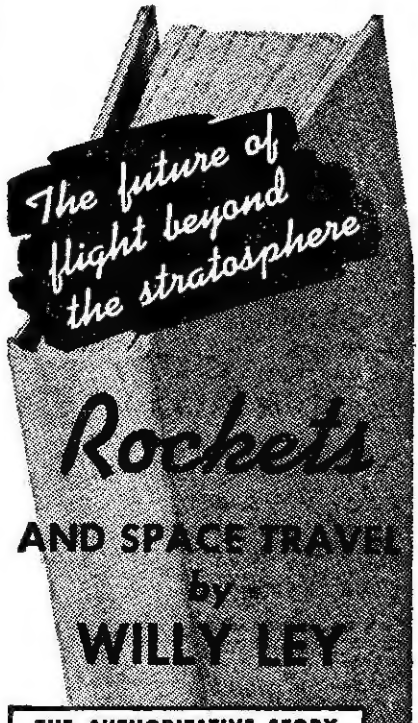
"Everything will be cared for," said Dupre. When we really have to get action, we get action. The whole conduct of the affair has been placed in my hands, by-passing even Moroccan authority and the general staff here. It will all be cared for with dispatch. And not a word of it will leak out, M. Goddart."

Goddart misread this last. It was as though he had been caught reading Fabrecken's letter. He flushed and stood up. "What gave you the idea that I didn't want this known?"

Dupre blinked at him. This thought had not entered his head. He had merely attempted to show that intelligence moved on very quiet feet and that he was intelligence. He thought the remark odd but the next moment he dismissed it. After all one could not harbor thoughts about the president of the *Banque Francais*. But it was uncomfortable, all the same. It was as though the *Banque Francais* owned the army—which, of course, was silly in a Republic.

Goddart, accustomed to reading men's faces and detecting there betraying emotion, found nothing but surprise and hurt pride and so turned graciously formal.

"Thank you very much, general, for showing me how efficient you are. Ah, to be an army man! Action, adventure, romance! Dashing figures, army men. While I, I have to sit amongst moldy ledgers and spend a life of drudgery, absorbed wholly in notes and stocks and discounts. A weary life, my dear



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general. A weary, powerless and ineffective life."

Dupre cheered him up. He assured him that M. Goddart was respected and that banking was probably interesting, too. And that M. Goddart was probably not without a certain power in his own field. Thus commiserating with him, Dupre showed him to the door.

Going back to his desk Dupre sat down and mopped his face with the red bandana. He actually felt sorry for the close-herded life of M. Goddart. He should have, too!

A company of Chaseurs d'Afrique, a battalion of the Legion Etrangere, and a few native guides departed the following morning for Destination X.

They were very hot trudging through the sand of the Moroccan desert, very uncomfortable in their contractor mis-made uniforms, cursing the lot which selected them and not another company.

Decent young men, most of them, who had joined up to keep eating, veterans of the war many of them who had found that civilian life no longer wanted them, disgusted all of them.

The senior and junior colonel consulted some maps and looked back to where horses were being led in dust and men tramped in dust and mules of the mountain battery wallowed in dust and were quite satisfied. The junior colonel had a terrible hangover from a night spent in Bizerte and a very bad opinion of the senior colonel's route, equipment, training and temper. But somehow the junior held his peace—odd how juniors always do in the army—and the column continued.

It was terribly hot. The sun hit them like a sledge hammer. The desert reflected the sun back and smote them as a loud echo might. Three rookies had already drunk their water and their tongues were wooden in their mouths even so.

Nobody thought to ask where they were going or why. But, after all this discomfort, when they did get there somebody was sure going to catch hell.

Orders were orders and they went.

They knew not the history of the ground where they walked, the composition of the government which sent them, the training or capabilities of their officers, the cause they embraced. They merely went. When they got there they would fire and then some of them would come back. They merely went.

TO BE CONCLUDED

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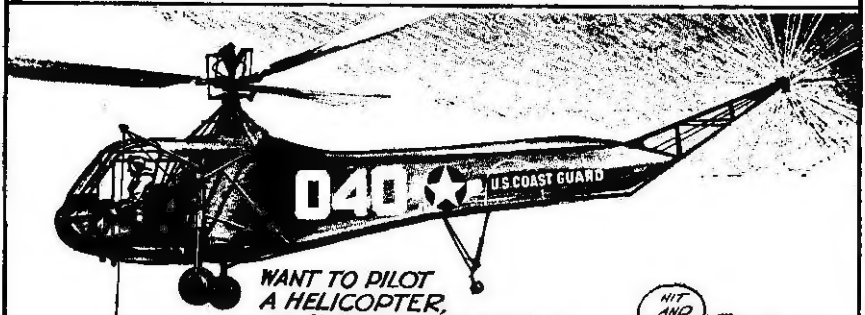
A LIFE OF ACTION FOR MEN OF ACTION!

By Pap.



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